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Sixteen partially seeing children in grades 1 to 8 who were enrolled in a special resource room program were slected for differential diagnosis; their characteristics as a group and as individuals were delineated. Tests administered were the Stanford-Binet Intelligence Scale, Illinois Test of Psycholinguistic Abilities, Wechsler Intelligence Scale for Children (verbal section), Benton Visual Retention Test, Vineland Social Maturity Scale, a sociometric technique, California Test of Personality, and Michigan Picture Test. Each subject's mental age was used in the Horn formulas (1947) to determine reading and arithmetic expectancies; the Stanford Achievement Test in large and regular size type was used to determine actual achievement, and oral reading was measured Gray's Oral Reading Paragraphs tests and four subtests of the Monroe Diagnostic Reading Examination. The following hypotheses regarding the partially seeing were upheld: they are not achieving at a level equal to their abilities (discrepancies at .05 level); their psycholinguistic processes which involve visual and motor abilities are inferior to their auditory and vocal abilities, they are less well accepted in class than normal seeing peers. The data did not support the hypotheses that, compared to the seeing, partially sighted childred have inferior visual memory, are less socially mature, or show poorer personality adjustment. Three case studies are provided. (LE)

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Merle B. Karnes
and
Janet P. Wollersheim

Champaign Community Unit 4 Schools
Department of Special Services
E. H. MELLON
Superintendent of Schools
March, 1963

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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AN INTENSIVE DIFFERENTIAL DIAGNOSIS OF PARTIALLY SEEING CHILDREN TO DETERMINE THE IMPLICATIONS FOR EDUCATION

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The program for the partially seeing in Champaign dates back to the year 1934. It was one of Champaign's first efforts to provide for exceptional children in the public schools. While this program has served many children over the years, continued educational progress demands that existing programs be continually evaluated. This research represents one of the efforts of the Champaign schools to improve the quality of education for exceptional children. Dr. E. H. Mellon, Superintendent of Schools, and Dr. Earl D. Patton, Assistant Superintendent of Schools, have provided the leadership and encouragement necessary for conducting this research. Without their genuine interest and constant support, this research project would never have been initiated.

Indebtedness is also acknowledged to Dorothy Bryan, Illinois State Consultant for the Partially Seeing; Helen Gibbons, Consultant in Education, National Society for the Prevention of Blindness; Dr. John W. Ferree, Executive Director of the National Society for the Prevention of Blindness; and J. Knox Milligan from Stanwix House, Incorporated, who by their enthusiasm encouraged the researchers to conduct this study. The proposal for this research was first discussed with the above mentioned at the annual convention of the Society for the Prevention of Blindness held in Denver, Colorado in April of 1960. Following this convention, the written proposal was sent to the Society for the Prevention of Blindness. Staff of the Society requested that Dr. S. A. Kirk, Director of the Institute of Research for Exceptional Children, University of Illinois, be asked to evaluate the written research proposal. Thanks are extended to Dr. Kirk for spending time reviewing the proposal and acknowledging its merit to the Society.

Gratitude is expressed to J. Knox Milligan, William M. Eakin, and Robert J. Pratt from Stanwix House, Incorporated; Dr. Rupert N. Evans, Associate Dean of Research of the College of Education, and Dr. William Rogge, Research Consultant, College of Education of the University of Illinois, for their careful review and helpful criticisms of the final research report.

The excellent cooperation of the special teachers, Sara Disa McCall and Ruth C. Kearns, as well as support from the principals and regular teachers of the schools where the partially seeing are enrolled, facilitated the collection of the research data.

Merle B. Karnes
Director of Special Services

Janet P. Wollersheim
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FOREWORD

One of the first of the several programs in the Champaign schools to provide for the special needs of handicapped children was the program for the visually handicapped. Since 1934, partially seeing children at the elementary level have been provided with a special classroom equipped with appropriate lighting, large print textbooks, unglazed paper, special desks, typewriters, and tape recorders. These provisions enable the children to use their limited sight to the best advantage. At the secondary level, an "itinerant" teacher goes to the various buildings where partially seeing children are enrolled and provides the services indicated by each child's handicap. Some of the state's most knowledgeable and experienced teachers have been assigned to this program.

As a part of our continuing concern for evaluation and improvement of our programs, a two-phase study has been designed by Dr. Karnes, Director of Special Services, Mrs. Wollersheim, Staff Psychologist, and two teachers, Miss Disa McCall and Mrs. Ruth Kearns. Phase One of the study, which is reported here, is concerned with a systematic investigation of certain of the specific strengths and weaknesses characteristic of partially seeing children. An intensive differential diagnosis method has been utilized in the investigation.

Presently, modifications of our educational program for the partially seeing are being made based upon the findings of this study. Phase Two of the study will attempt to evaluate the effectiveness of the change in the program.

Dr. Earl D. Patton
Assistant Superintendent of Schools

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Chapter I

INTRODUCTION

The first special provision for children who were not blind but who had visual problems so severe that they were unable to profit from the educational program provided for children with normal vision was organized in England in 1907. The class was referred to as the "myope class". The first class established in America for the visually handicapped who were not blind was in Boston in 1913. During this same year Cleveland opened a class. The terminology used in reference to such classes has undergone changes. The first class in Boston was called the "defective eye sight class". Other terms that have been used over the years are "semi-blind", "semi-sighted", "conservation of vision", "sight saving", and "partially seeing". The nomenclature used has lead to much misunderstanding in regard to the purpose of special educational provisions for this group of children with impaired vision, which is to foster optimum development of their potentials. Thus, the more comprehensive and more positive terminology "partially seeing" has gained acceptance and is currently commonly used when referring to this segment of handicapped children.

While special provisions for partially seeing children have increased markedly since the first class was established in this country fifty years ago, the practices relative to educational methods and techniques, materials of instruction, special equipment, guidance, organizational plans, and teacher training programs have been guided by the experiences of practitioners. Research to verify opinion has been meagre.

Problem

No one person has exerted a greater influence on programs for the partially seeing than Mrs. Winifred Hathaway, an outstanding leader in the field of the partially seeing. Her book is generally used as a text in training programs for teachers of the partially seeing. Subsequently the programs throughout the country are conducted very much in accordance with Mrs. Hathaway's recommendations. Her book was first published in 1943 and was revised by her in 1947 and 1954. The fourth edition (1954) was published after her death by Foote, Bryan and Gibbons and to a great extent retains Mrs. Hathaway's points of view. The recommendations made in the four editions are largely based on experience and observation. Few have been validated through research.

Educators have been led to believe that providing these children with special equipment and materials of instruction will enable them to follow the curriculum of the regular school program and thus work at a level commensurate with their intellectual ability. There is not sufficient knowledge at this time regarding the psychological processes of partially seeing children and their achievement to be assured that partially seeing children need no special methods or techniques of instruction. In the fourth edition of Hathaway's (1954) book, this statement appears:

> "As the superstition surrounding vision and its use has been dissipated by research, it has been recognized that the same techniques used in teaching normally seeing children apply also

> in teaching partially seeing children. Perhaps the most important function of the special teacher is to combine the use of these techniques with the provision of special equipment and media when it is needed either in the special or regular classroom."

The research referred to above is medical research which can not in and of itself determine methods and techniques of instruction. It is interesting to note that of the 192 pages of Hathaway's book (1954), only four and an eighth pages were actually devoted to a discussion of teaching the partially seeing child. The remainder of the book covers such aspects as identification of the partially seeing, financing programs, working environment and educational media. The logical reason to explain why so little space is devoted to methods and techniques of teaching these children is that there has been little or no research to indicate that partially seeing children need special methods and techniques of instruction. If this be so then professional books on methods and techniques used in teaching the normal will suffice. On the other hand if these children have specific needs their instructional program may require not only devotion of more time to them but also the use of special methods and techniques to help them overcome and/or compensate for specific weaknesses that hamper their total adjustment.

The primary purpose of this study was to investigate the specific strengths and weaknesses of partially seeing children through an intensive differential diagnosis to enable educators to design an educational program to facilitate the total adjustment of this group of handicapped children. This study reports the results of Part I of a larger study which will involve educational treatment based upon the specific needs as delineated by the present research. Part II of the study will evaluate the effectiveness of the educational treatment that utilizes special methods and techniques in instructing the partially sighted and intensive social case work on an individual and group basis with pupils and their parents.

Chapter II

REVIEW OF RESEARCH

The research that has been conducted on partially seeing children has been almost exclusively in regard to the medical, physiological, and optical problems of these handicapped children. A careful review of the literature has revealed little research on the various facets of the partially seeing child's development as they are related to an educational program.

Pintner (1941) reviewed the literature on the partially seeing child. At the conclusion of his chapter he made the following statement:

> "The chapter shows our ignorance rather than our knowledge. The special education of the partially seeing child is so recent that practically all of the effort and interest in this work has been concentrated on the organization, administration, and equipment for these classes. About the children themselves from a psychological point of view we have practically nothing."

Meyerson (1953) explains in part the lack of educational research on the partially seeing as follows:

> "Lack of adequate sponsorship, lack of financial support, and perhaps lack of interest in research on the part of administrators responsible for sight-conservation classes would be a major stumbling block to the replacement of opinion by fact in this area."

Lowenfeld (1953), in discussing why there has been so little research on the partially seeing child, says:

> "He is, for all practical purposes, a seeing child, and his handicap, if it is one, does not affect him in any different way from other children who slightly deviate from the 'normal'. This is the conclusion of the few studies that have been made, and it has undoubtedly discouraged others from further research. It would, however, be quite valuable to know more about the ways in which children react to visual handicaps which put them into the category of partially seeing children."

Six years later Ashcroft (1959) reviewed the literature on the partially seeing and found the same void in research to exist. He stated:

> "The plea for more educational research must be made again, for there has been too little upon which to build optimum programs for visually handicapped children."

Research in the field of the partially seeing and on vision anomalies as causal factors in reading disability are discussed under the following headings: (1) visual impairment, (2) intelligence, (3) sex, (4) personality, (5) achievement, (6) type size, and (7) psycholinguistic processes.

Visual Impairment

Two large scaled surveys on partially seeing children in the United States have been made. The first was conducted by Myers (1930), the second by Kerby (1952). Myers (1930) used the classes for partially seeing in the United States included in the 1928 report of the annual survey of the National Society for the Prevention of Blindness. The questionnaire method was used in obtaining the facts. Questionnaires were sent to directors and supervisors of 292 classes in 80 communities of 18 states. This study continues to be the primary source of information on many aspects of partially seeing children.

Myers (1930) compiled data on the specific eye defects of 2,771 children in sight-saving classes. The most common eye defects in order of frequency were: myopia, hyperopia, nystagmus, and astigmatism. These four eye defects comprised 74.6 percent of the entire number or 2,067 of the 2,771 subjects had these eye defects: 38.9 percent of the whole group had myopia and its combinations. No data are available in this report on the percent of cases who have visual acuity lower than 20/70, between 20/70 and 20/200, or greater than 20/200.

Kerby (1952) also used a questionnaire in collecting her data. Her subjects were partially seeing children enrolled in 600 of the 675 classes for partially seeing children in the United States, a total of 7,310 subjects. She found that 57.7 percent of her subjects had myopia, hyperopia, and nystagmus. Astigmatism was not reported as a separate eye defect in this study.

Among her 131 subjects Bateman (1962) found that 37 percent had refractive errors (myopia and hyperopia plus astigmatism); 15 percent cataracts; 13 percent retrolental fibroplasia; 17 percent muscular imbalance.

In a study made by Pintner (1942) using 518 partially sighted subjects, he reports data relative to visual acuity of the subjects in his study. The findings of Pintner (1942), Kerby (1952), and Bateman (1962) on visual acuity are found in the following table:

Table 1

VISUAL ACUITY OF PARTIALLY SEEING CHILDREN

Researcher	Date of Report	Number of Cases	V.A. Greater Than 20/70	V.A. 20/70-20/200	V.A. Less Than 20/200
Pintner	1942	518	42.5	55.0	2.5
Kerby	1952	7,310	40.0	52.2	7.8
Bateman	1962	131	38.0	34.0	23.5*

*The visual acuity of 4.5% of Bateman's subjects was unknown.

Pintner's (1942) and Kerby's (1952) studies reveal that approximately 50 percent of their subjects had visual acuity between 20/70 and 20/200 which is compatible with the usual definition of the partially sighted.

While Bateman's (1962) findings are slightly less, they are still comparable. It will be noted that the percentage of legally blind children as reported by Bateman (1962) has more than doubled the number reported by Kerby (1952) ten years earlier. Likewise, in the ten year period between Pintner's study (1942) and Kerby's (1952), there were 5.3 percent more legally blind reported as being included in programs for the partially seeing.

One explanation for the larger number of legally blind children in partially seeing programs in Bateman's study (1962) as compared to Pintner's (1942) and Kerby's (1952) research is that the problem of retrolental fibroplasia did not constitute the problem among school children at the time of these studies. Still another explanation is that research which has resulted in improved optical aids has made it possible for some children to learn through the avenue of vision whereas at one time these children would have been educationally blind and thus have had to be taught braille in a program for the totally blind.

The girls in Bateman's sample (1962) were more severely visually handicapped than were the boys, as indicated in Table II.

Table 2

SEX AND DEGREE OF VISUAL DEFECT

	Mild Defects Less than 20/70		Moderate Defects 20/70 - 20/200		Severe Defects Greater than 20/200	
	%	N	%	N	%	N
Boys	45	33	38	28	17	12
Girls	33	17	31	16	37	19
Total	40	50	35	44	25	31

Intelligence

Myers (1930) found that the average IQ of 709 subjects in his study who were reported to have been given a psychological examination was considerably below normal. There is a question as to the reliability of the data since a psychological examination did not necessarily indicate an individual assessment of intelligence. There were 93 children in the below 70 IQ group which poses the question as to whether they should have been admitted in a sight saving class since mental retardation is considered a greater handicap than partial sight. Ordinarily such children would be either placed in a program for the mentally handicapped or in some communities in a program for the multiply handicapped. The mentality of children in Myers' study (1930) who had no psychological examinations were judged by teachers. According to the judgment of the teachers their intelligence was within the normal range. The reliability of either set of data is questionable.

Pintner (1942) has conducted the most extensive study on the intelligence of partially seeing children using an individual assessment of intelligence (Stanford-Binet). He found the mean IQ of his 602 subjects, who ranged in chronological age from 10 to 12, to be 95.1. His findings did not indicate that partially seeing children are less intelligent than normally seeing children. He did report that the range of IQs of his subjects was from 44 to 166, which indicates that mentally retarded children were admitted to sight saving classes contrary to the commonly accepted practice of placing children in special classes according to their greatest handicap.

Bateman (1962) found the mean IQ of her 131 subjects was 100. The Revised Stanford-Binet Intelligence Scale, Form L, was administered to all subjects who had not previously had a Binet or WISC (Verbal) score. A few children were re-examined because the teacher questioned the available IQ. Of the 131 subjects, 77 were given the Binet which constituted 60 percent of the subjects. The mean IQ of the girls was found to be 97.5 compared to the mean IQ of 101.7 for the boys.

Livingston (1958) administered Binets to 60 partially sighted subjects with chronological ages of 8 and 9 whose visual acuity fell within the 20/70 to 20/200 range. He reported a mean IQ of 98.6 which is compatible with the findings of Pintner (1942) and Bateman (1962). He analyzed the performance of subtests of these subjects and found no statistically significant differences between the performance of his partially seeing subjects and 407 normal seeing children with two exceptions--partially seeing subjects were higher on auditory memory (memory for digits not included) and lower on visual-motor coordination.

Pintner's study (1942) involving 602 ten and eleven year old children enrolled in sight-saving classes used the regular type size Revised Stanford-Binet and retested with the enlarged Stanford-Binet materials and found that no penalty was imposed on partially seeing children by using the regular Stanford-Binet except in cases of children with less than 20/200 vision in the better eye. Livingston's findings (1958) concurred with Pintner's.

Sex

Myers (1930) found that among his 2,860 subjects, 1,425 (49.8 percent) were girls, and 1,435 (50.2 percent) were boys, similar to the percentage of boys in Kerby's (1952) study (57.2 percent). Bateman (1962) found the ratio of boys to girls to be three to two in the special programs for partially sighted children in her study (59.2 percent).

Personality

Pintner and Farland (1943) studied the personality of 442 children enrolled in sight-saving classes. The Pupil Portraits Test and the Aspects of Personality Test were administered. They found no significant difference in the scores of the children in sight-saving classes and a group of children with no visual defects. There are, of course, some definite limitations inherent in using paper and pencil tests of personality. Another consideration is that the personality test used may not have been sensitive to the problems of these children.

Livingston (1958) made clinical interpretations of performances of his 60 partially seeing subjects as compared with 407 seeing children and concluded that the partially seeing are less well adjusted than their normal peers. There were no objective data supporting these inferences, however.

Mull (1948) studied the relationship between myopia and introversion. She administered the Bernreuter Personality Inventory to 100 Sweet Briar College students. Forty-seven had normal vision and 53 had visual impairments ranging from 20/40 to 20/800. Her findings indicated no significant differences between the two groups, 74 percent of the myopic subjects were extroverted and 83 percent of normal vision subjects were extroverted.

Bender and others (1942) made a study of 124 Dartmouth College students who had mild physiological visual impairments. Seventy-one percent were reported to have mild to severe visual handicaps. The findings of this study did not indicate that visual impairment played a significant role in academic aptitude, achievement, personality, or motivation of students with visual anomalies.

In evaluation of the findings of Mull (1948) and Bender (1942), it should be noted that a selective factor had already been operating in determining which partially sighted individuals would attend college.

Glueck and Glueck's study (1950) involved an investigation of 500 pairs of delinquent and non-delinquent boys for nystagmus, hyperopia, strabismus, myopia, eye injury and other visual impairments. These researchers found no significant differences between the two groups.

Force (1956) and Murphy (1960) found that the sighted peers had negative attitudes toward the partially seeing children. The partially seeing children were not accepted for play or work activities.

Underberg (1958) studied sighted, totally blind, legally blind, and partially sighted adolescents and their families. Her findings indicate that the partially sighted have more difficulty accepting their handicaps than those with more severe visual handicaps.

Achievement

Two studies have been reported on reading achievement of partially seeing children. Peck (1933) studied the reading achievement of children enrolled in sight-saving classes in the Cleveland Public Schools. The Stanford Achievement Reading Test was administered to the first six grades. She found that these subjects were above grade level on paragraph meaning (.32 months), sentence meaning (.10 months), and word meaning (.03 months). To determine whether or not the reading grade level would increase if the time were extended, she extended the time 50 percent and found no significant increase in scores. Peck did not attempt to determine the extent to which these children were reading at a level commensurate with their mental ages.

Bateman (1962) investigated the reading achievement of 96 partially sighted children in grades two, three, and four and compared the achievement of these children with normal children on four reading tests (oral reading - Gray's Standardized Oral Reading Paragraphs, 1916; silent reading - Gates Primary or Advanced Primary Reading Test, Paragraph type, 1958; word recognition - Iota Test of Word Recognition, Monroe, 1932; and word discrimination - Monroe Word Discrimination test, 1932.) from which she obtained an average reading grade. She found that the fourth grade subjects (39) were achieving 3.5 months below grade placement, the third graders (40) were 2 months above grade placement, and the second graders (17) were 4 months above grade placement; however, the second graders were selected as the best readers in their group and were not representative of partially seeing second grade subjects. All three grade levels did less well on the oral reading. She concluded this might be due to outdated norms or the speed factor included in administering the test. The third and fourth graders scored highest on the silent reading test (third graders one-third months above grade level and the fourth graders were two months below grade level.) She compared reading achievement with mental age and found that three out of five partially seeing children were reading below their mental age. Bateman used straight mental age and made no correction for the life experiences of these children as reflected by their chronological ages. The generally accepted correlation between reading and mental age is approximately .66. There was an average discrepency among her subjects between reading grade and actual grade placement of less than one-half month. There were no statistically significant difference between the reading achievement of boys and girls enrolled in programs for the partially seeing in this study. It is interesting to note that the partially seeing subjects in this study were more accurate in reading than normal children.

An analysis of reading errors made by partially seeing children was also analyzed by Bateman (1962). She used both Monroe's standardized group and a comparison group of normal subjects and found that her subjects made more vowel errors than either of the groups of normal seeing children. The researcher felt that the vowels did present the most problems for these children. Those children with mild visual defects made even more errors than those with severe visual defects. She pointed out that since the partially seeing children with the lowest IQs were also the ones with mild visual defects that vowel errors may be related to low mental ability.

Bateman (1962) also found that her subjects made more consonant errors than Monroe's standardization group but did not differ from Monroe's group on reversals but were high when compared to the comparison group. These subject did not make excessive sound addition, substitution, repetition, added words, or omitted word errors.

Reading achievement and error types in relationship to visual acuity and eye conditions were investigated by Bateman (1962). There were no significant differences between the reading achievement of the mild (under 20/40), moderate (20/20 to 20/200), and severe (greater than 20/200) defect groups. The mild read less well in relation to grade placement than the other two groups. This group also had the lowest IQs. Those children with refractive errors read less well than those with visual defects other than refractive errors. There were no significant differences between the error profiles of the three defective groups (mild, moderate, severe).

Myers (1930) asked each teacher of sight-saving classes in his study to state each child's poorest and best subject. Thirty-two different subjects were included in the number rated as "best" and twenty-nine in the number rated as "poorest". The six subjects mentioned as "poorest" and "best" more than 100 times were arithmetic, reading, spelling, English, history, and geography. The greatest variation was in reference to arithmetic which was rated as the best subject in 4.1 percent more cases than it was mentioned as the poorest.

Researchers in the field of reading have conducted numerous studies on the relationship between visual defects and reading disabilities. Although these studies have not drawn their subjects from classes for the partially seeing, the findings of research with mild visually impaired children seems to have some pertinence to this study. Research does indicate that some visual problems have more significance in relation to deficiency in reading than others. Robinson (1948) made an intensive study of thirty poor readers ranging from age six to fifteen years, three months. She found that hyperopia was more common among these children than any other type of refractive error.

Farris (1934) studied 768 cases, half of which had visual defects and half had normal vision. It was found that hyperopia accompanied by strabismus was related to lack of progress in reading. In reviewing the literature, Hirch (1955) reports that reading problems are related to hyperopia. The studies of Eames (1955), Farris (1934), and Bartlett (1954), indicate that myopia, if not too marked, is an asset to reading.

While researchers have not found a conclusive relationship between astigmatism and reading failure, marked degrees of astigmatism can be a casual factor according to Romaine (1949) and Cleland (1953).

Aniseikonia has been found to be definitely related to reading failure by Dearborn and Anderson (1938). Muscular imbalance and fusion difficulties have been found to be positively correlated with reading problems by such researchers as Park and Burri (1943) who studied 255 children from the first through the eighth grades. They found the eye defects most closely related to poor reading to be exophoria, esophoria, and fusion difficulties.

Fendrich (1938) studied a total of 128 pupils in grades two, three, and four who were manifesting reading disability and matched these with a comparable number of good readers. He discovered that the reading disability group had inferior visual acuity. There was no difference in muscle-imbalance. The most significant finding was pertained to methods of teaching. One group of children with visual defects was taught by a method using predominately the sight approach and the other group of children with visual defects was taught by a phonics approach. The findings indicated that children with visual impairment make better progress if a phonetic method of teaching reading is used.

Some of the possible reasons why there is disagreement among researchers as to the relationship between visual defects and reading are as follows:

- Researchers have used a variety of ways of determining visual defects. Some studies have had reports from eye specialists; others have used results of screening tests; and still others stated the eyes of the subjects were "inspected".

- Children with visual defects included in studies varied considerably in the degree of eye defects.

- The criterion for determining a reading disability has varied among researchers.

- Age of subjects have varied from first grade to college.

- Methods and quality of teaching have not been taken into account in comparing good and poor readers.

Type Size

Eakin, Pratt, and McFarland (1961) reported the Stanwix House Study (1952) and in addition critically reviewed the studies on type size and style for the partially seeing child conducted by Irwin (1919-1920), Fortner (1943) and Nolan (1959) and pointed out the limitations of each study. One such limitation is that each researcher used a different standard for measuring type. Also another limitation was the small size of the sample made it impossible to arrive at statistical significance regarding type size. It was also noted that three of the four studies failed to hold the reading distance constant. Still another criticism was that variables of time and fatigue was not always given due consideration when measuring ability too see.

The Stanwix House study (1952) showed that there was a significant increase in the number of partially seeing subjects who could read 24 point type as compared to the numbers of partially seeing children who could read type sizes smaller than 24 point type. Thus, the use of 24 point type with partially seeing children is superior than smaller type sizes and likewise 18 point type is superior to 12 point type. Although it is felt by some that the larger the type the slower the speed, this research did not bear out this contention. There were no significant differences in reading speed when different size type was used although there was a slight increase when the size of type was larger. For those who could see to read, the results did not show any significant differences which would indicate that reading accuracy varied with type size.

Psycholinguistic Processes

Bateman (1962) administered the Experimental Edition of the Illinois Test of Psycholinguistic Abilities (McCarthy and Kirk, 1961) to 93 subjects in grades one through three and compared her findings with the standardization groups (N of 700). She found that the partially sighted subjects did not differ from the standardization group on the auditory-vocal channel subtests but were significantly lower on visual decoding, motor encoding, visual-motor sequential, and visual-motor association subtests. These findings were relevant more to the severely visually handicapped than to the moderately or mildly visually handicapped subjects. The low IQ children were markedly low on auditory vocal association. A visual channel deficit was found among those with severe visual defects and was less apparent for the mild and moderately handicapped subjects.

She also determined the relationship between reading and psycholinguistic progresses in partially seeing children. Reading achievement was found to be positively and significantly correlated with the auditory-vocal sequential, visual-motor sequential and auditory-vocal automatic subtest of the Illinois Test of Psycholinguistic Abilities. She, likewise, found 12 low but significant correlations between subtests of the ITPA and certain error types.

Discussion of Previous Research Findings

Limited research has been conducted in the field of the partially seeing as it relates to educational programming. The research has been generally inconclusive, contradictory, and lacking in specific implications for the improvement of educational programs for the segment of exceptional children. The interpretation of many of the findings has lacked clarity for a number of reasons including:

- In many cases there has been a confounding of mental retardation with visual anomalies. Mentally retarded children reportedly were in special programs also served as subjects in research studies. Thus, it has been difficult to determine in many cases whether the delineated deficiences are due to mental retardation, visual impairment or a combination of both.
- The criteria of eligibility on the bases of visual impairment is questionable in some studies. A number of researchers have reported that among their subjects some had no identifiable visual problems. This infers different administrative procedures are followed regarding admission of pupils to special classes. Since such subjects were included in some studies of the partially seeing, generalization made from findings are necessarily questionable.
- While a few studies have attempted to pin point specific needs of partially sighted children, there has been no attempt to formulate on a research basis specific educational programs designed to help these children overcome and/or compensate for specific weaknesses and to evaluate the effectiveness of such treatment programs based upon these delineated needs.

Researchers and those working with partially sighted children are impressed by the heterogeniety of this group. It appears that the case for more fruitful research would be better served if some national society concerned with partially sighted children would compose a brochure delineating the variables that should be reported in research studies concerning this group of children. Encouraging researchers to report on consistent variables would render the research on the partially seeing more meaningful and allow for better comparison of different studies.

Chapter III

THEORETICAL ORIENTATION AND HYPOTHESIS

Theoretical Orientation

The set of conditions causing a child to be partially seeing may also cause the child to have other physiological impairments which may impede his learning by the usual methods and techniques effective with the so called "normal-seeing" child. Physical abnormalities predispose the child to develop social and emotional problems which in turn are inhibitors to learning.

When a child feels that he is different from other children he is prone to feel less adequate and less self-confident. Lack of confidence makes a child reluctant and fearful of putting forth his best efforts in academic situations.

Likewise, he is hesitant to make overtures or attempts to establish close relationships with his normal seeing peers for fear he will not be accepted. As a consequence of his lack of normal social experiences, he is socially inadequate.

Attitudes of parents toward handicapped children are reflected in the child. It is more difficult to be accepting of a child who deviates from the normal. Lack of acceptance or rejection as well as other parental attitudes may take the form of overprotection of the child which in turn makes him more dependent, less mature, and may result in emotional maladjustment.

A child with a handicap, then, experiences difficulties over and above those that the normal child experiences as he embarks upon a course of ego development. Somehow he must incorporate his handicap into his self-concept. Success experiences and experiences which enable him to perceive himself as an adequate person who can cope with environmental difficulties will aid him in realistically viewing his handicap and forming a self-concept that is positive.

The relationship between personality and school achievement is viewed as one of mutual reinforcement. Satisfactory school experiences promote adequate personality development and similarly good personality development is conducive to good school adjustment. Schools do not directly teach or train for personality development but significant aspects of personality formation occur within the school setting. The learning of appropriate goal setting, experiencing satisfactory peer relationships, obtaining satisfactions from status, recognition and acceptance outside of the family, attaining self-reliance in meeting demands and obligations, assuming the responsibility for the consequences of one's actions--all these are important aspects of personality formation which occur within the school setting. By offering the handicapped child opportunities for success experiences in these areas and by encouraging him in patterns of behavior that are conducive to good personality formation, the school not only helps him become a better adjusted individual but is also setting a milieu that favors academic learning and success. Within such an environment the school more readily accomplishes its important task of helping the child acquire an education and grounding in academic material so that he will be able to take his place as a useful member of society.

Hypotheses

Since the current programs for partially seeing children are guided primarily by experience and observation, new knowledge obtained through research should enable educators to improve the educational offerings to this segment of handicapped pupils. While it is apparent that partially seeing children need special education, it is the contention of this study that the present special program can more adequately meet the specific needs of these children when such needs are more precisely determined. In seeking more information about partially seeing children, the following hypotheses are tested:

1. Partially seeing children enrolled in a special program (resource room) are not achieving at a level commensurate with their intellectual potential. (Data utilized: Binet intelligence test and achievement tests with the use of Horn formulas in determining expectancies)
2. The psycholinguistic processes involving visual and motor abilities of partially seeing children are significantly inferior to their auditory and vocal abilities. (Data utilized: Illinois Test of Psycholinguistic Abilities)
3. The visual memory of partially seeing children is inferior to that of normal seeing children. (Data utilized: Benton Test of Visual Retention)
4. Partially seeing children are less socially mature than normal seeing children. (Data utilized: Vineland Social Maturity Scale)
5. Partially seeing children are less well accepted in regular classes than their normal seeing peers. (Data utilized: California Test of Personality)

In addition to testing the above hypotheses, this study will render information concerning the way these children perform on a variety of different measuring instruments. This study will answer the following questions:

1. How do the Binet IQs compare with the WISC Verbal IQs?
2. Is there any difference in their performances on the subtests of the WISC?
3. How does the performance of these partially seeing children differ on various facets of reading?
4. Are there any differences in arithmetic and reading achievement scores when large print tests are used as contrasted with regular print?
5. What personality characteristics do partially seeing children manifest on projective techniques.

Chapter IV

DESCRIPTION OF STUDY

Overview

Before a child is placed in the partially seeing program he is the subject of a complete psycho-educational diagnosis conducted by a qualified psychological examiner. Detailed reports concerning his visual difficulties and needs are obtained from an eye specialist. In some cases when an additional medical problem appears to be involved the child is required to have a complete medical examination by a pediatrician. Any child who fails the hearing screening tests is seen by an otologist. School principals, regular teachers, special teachers, personnel in the department of special services, and parents are all asked to cooperate in providing information concerning the child so that a satisfactory educational program can be prescribed.

After the pertinent information has been obtained, a case conference is called by the director of special services. Findings are shared, the child's eligibility for the partially sighted program is reviewed, a differential diagnosis is made and an educational program is outlined. Case conferences are recorded and made a part of the child's composite case study.

This process of gathering information on the child and prescribing a treatment program on the basis of his needs is repeated every three years or more frequently if the child is not progressing as well as expected.

In this study, an attempt was made to obtain a more thorough and complete differential diagnosis of partially sighted children and to specifically delineate their characteristics both as a group and as individuals. To do this, a detailed testing and evaluation program was conducted in the fall of 1961. This program consisted of administering many instruments to obtain information over and above that contained in the composite case studies of each child.

Selection of Subjects

Partially seeing children selected for this study included all children who met the Illinois criteria for admittance to the program and conformed to the interpretation of a partially seeing child as defined by the National Society for the Prevention of Blindness (see appendix). Children in the study were required to meet the additional criterion of being in school the following three years so they could participate in a treatment program. Sixteen children met these criteria and comprised the sample for this study.

Characteristics of Subjects

The subjects are described in terms of eye anomalies, hearing difficulties, age, grade placement, race, sex, socio-economic status, and intelligence. Tables 3 - 5 summarize this information.

Table 3 describes the number of incidents of occurrence of various visual anomalies in the sample. It should be noted that 14 out of the 16 cases in the sample (87.5%) had more than one visual difficulty. This accounts for the fact that the number of conditions reported exceeds the number of subjects in the sample. The miscellaneous category includes anomalies that occurred only once and which existed in addition to other classified visual difficulties. These miscellaneous anomalies included retrolental fibroplasia, aniridia, choriomacular degeneration, optic nerve atrophy, detachment of retina, aphakia, and choroidal degeneration.

Table 3

EYE ANOMALIES OF SUBJECTS

Anomaly	Number of Occurrences in Sample
Myopia	7
Hyperopia	4
Astigmatism	7
Amblyopia	3
Muscle Balance Difficulties including:	
Nystagmus	2
Strabismus	3
Congenital Overaction of Muscles	1
Absence of One Eye With Severe Impairment in Other Eye	2
Miscellaneous Anomalies	7
Subjects With More Than One Anomaly	14

Classification of visual acuity in the better eye after refraction is described in Table 4.

Table 4

VISUAL ACUITY OF SUBJECTS IN BETTER EYE AFTER REFRACTION

Visual Acuity	No. of Cases	Percentages of Cases
Better than 20/70	8	50%
Between 20/70 and 20/200	4	25%
20/200 or less	4	25%
Total	16	100%

It should be noted that only 25% of the subjects have a visual acuity between 20/70 and 20/200 in the better eye after refraction and thus meet this criterion of eligibility for the Illinois program. However, the eligibility criteria for this program states that each child should be given individual consideration and that "too many people have considered the 'general rule', a visual acuity ranging from 20/70 to 20/200 in the better eye after correction, as the chief basis for admission to classes for the child with partial vision" (Bryan, 1952). The standards for eligibility include ophthalmological opinion that a particular child would benefit from such a program. Other serious visual difficulties receive as much emphasis as the standard pertaining to visual acuity. Those children whose visual acuity is better than 20/70 (50%) have been included in the program because they have severe visual difficulties in addition to or other than that of visual acuity. Four children (25%) had a visual acuity of 20/200 or less in the better eye after correction. These children were included in the program for the partially seeing rather than the program for the blind because they have considerable usable vision and after individual consideration of each child, it was believed that the special program for the partially seeing was better suited to the child's needs.

All the subjects in the study with the exception of one passed the hearing screening tests on the pure tone audiometer. The child who failed the hearing tests was referred to an otologist who diagnosed the condition as catarrhal otitis media bilateral. The otologist further reported that the child's hearing was adequate for educational purposes.

Table 5 summarizes data concerning the age, grade placement, race, sex, socio-economic status and intelligence of the group.

Table 5

CHARACTERISTICS OF SUBJECTS

Age Range	Grade Placement	Race		Sex		Socio-Economic Status			Mean Binet IQ
		White	Negro	F	M	Upper	Average	Lower	
7 yrs., 0 mos. to 14 yrs., 11 mos.	1 thru 8 inc. (no 4th or 5th graders)	14	2	6	10	3 (19%)	9 (56%)	4 (25%)	103

The chronological ages of the subjects ranged from seven years, zero months to fourteen years, eleven months. These children were enrolled in grades one through eight although no subject was enrolled in the fourth or fifth grade at the time of the study. The sample consisted of two (12.5%) Negro children and fourteen (87.5%) native born white children. Ten males (62.5%) and six females (37.5%) comprised the sample. A χ^2 test revealed that the sample did not have significantly more of one sex than the other. An index of socio-economic status was obtained by classifying the father's occupation according to the Dictionary of Occupational Titles (DOT) published by the United States Department of Labor (1957). This classification places specific occupations into the following seven categories:

(1) professional and managerial, (2) clerical and sales, (3) service occupations, (4) agriculture, fishing, forrestry and kindred occupations, (5) skilled, (6) semi-skilled, and (7) unskilled. Since the sample in this study was small, the seven DOT classifications were combined into the following three categories: (1) upper socio-economic status including classifications 1 and 2, (2) average socio-economic status including classifications 3, 4 and 5, and (3) lower socio-economic status including classifications 6 and 7. According to this method of appraisal, 3 (19%) of the subjects fell in the upper group, 9 (56%) in the average group, and the remaining 4 (25%) in the lower group. The average intelligence quotient of the sample as measured by the 1960 Stanford-Binet was 104. Thus the mean IQ of the group falls within the average range of intellectual ability.

Method of Appraisal

The general learning ability (IQ) of the subjects was ascertained by scores made on the 1960 Stanford-Binet Intelligence Scale, Form L-M. The mental ages obtained on this instrument were used in the Horn formulas (1947) to determine reading and arithmetic expectancies. The formulas devised by Horn make use of the assumed correlation of .67 between reading and mental age and the assumed correlation of .50 between mental age and arithmetic competence. The formulas are as follows:

$$\text{Expected Grade Level in Reading Achievement} = \frac{2\ \text{MA} + \text{CA}}{3} - 5$$

$$\text{Expected Grade Level in Arithmetic Achievement} = \frac{\text{MA} + \text{CA}}{2} - 5$$

The results of these formulas have been found to be consistent with theoretical concepts and empirical observations concerning the relationships of reading and arithmetic achievement of children when both their mental and chronological ages are considered (Gallagher, 1959). These formulas take into account not only the intellectual ability of the child as manifested by his mental age but also his life experiences reflected by his chronological age.

The Stanford Achievement Test was used to determine actual achievement in the areas of arithmetic and reading. Both large (16 point) and regular (10 point) print Stanford Achievement Tests of comparable forms were used so that a comparison could be made of the difference in measured achievement when these two different types of print are utilized. Since the large print achievement tests theoretically allow the partially seeing child the best opportunity to manifest his actual learning, the results obtained on the large print achievement tests were compared to achievement expectancies (determined by the Horn formulas) to determine the extent of under- or overachievement manifested by the subjects. Reading discrepancies were obtained by comparing the child's reading expectancy (derived from the Horn formulas) with his actual reading achievement. The same procedure was followed to determine arithmetic discrepancy except the Horn formula for arithmetic was used.

By averaging the reading and arithmetic expectancy, average achievement expectancies were obtained. These average expectancies were compared to actual average achievement in reading and arithmetic. Average discrepancies in terms of grade placements were obtained.

Performance in reading was further measured by the Gray's Oral Reading Paragraphs Test (18 point) and four sub-tests of the Monroe Diagnostic Reading Examination consisting of the Iota Word Test, the b, d, p, q, u, n test, the Word Discrimination Test and the Sounding Test. The reading achievement of the subjects on the Gray's was compared to their reading achievement on the large print Stanford tests and to their expected level of reading.

The specific learning abilities of the subjects were appraised by the use of the experimental edition of the Illinois Test of Psycholinguistic Abilities (McCarthy and Kirk, 1961), the verbal section of the Wechsler Intelligence Scale for Children, and the Benton Visual Retention Test (1955).

Personal and social adjustment was assessed by the Vineland Social Maturity Scale (the subjects served as informants), a sociometric technique, the appropriate level forms of the California Test of Personality, the Michigan Picture Test, and relevant information from the individual case studies.

The sociometric instrument was devised by the Champaign schools (see appendix for a copy of the instrument). It consisted of nine situations depicting activities that children engage in with their peers. For each situation the child was asked to select three of his classmates with whom he would most enjoy participating in this activity. He was asked to rank his choices from first to third. This instrument was administered to all the children enrolled in the same regular classroom as the partially seeing child. The use of this technique enabled the researchers to determine the extent to which partially seeing children are accepted by their normal classmates in a variety of specific situations as well as rendering information concerning their over-all social acceptance by their classmates.

Enrollment in the partially seeing program requires that the child receive periodic ocular examinations. Information concerning the visual difficulties of the subjects were obtained from the detailed reports of the ocular evaluations.

Information concerning the hearing of the subjects was obtained from records of the child's performance on the school hearing tests (sweep test on pure tone audiometer) and the follow-up otological examination of children who failed the hearing screening.

Each child enrolled in the partially seeing program is periodically examined by a qualified psychological examiner who conducts a detailed psycho-educational study of the child. After this examination a case conference is held. This is attended by the psychologist, special teacher, regular classroom teacher, school principal, director of special services, and any other school personnel involved with the child such as the school social worker and speech correctionist, for example. Information concerning the child is shared and an educational program is outlined. Case conferences are recorded and made a part of the child's composite case study. Relevant information from these case studies is discussed in Chapter VI.

Method of Analysis of Data

In an attempt to present a description of partially seeing children, the analysis of the data obtained from this study proceeds in two ways: (1) statistical analysis of the data and (2) incorporation of the data in a discussion by means of a case study approach.

Statistical analysis of the data included study of the data and selection of appropriate statistical techniques. Care was taken to check the underlying assumptions of various statistical techniques and to use techniques which satisfied these assumptions. Some of the data are expressed in terms of percentages, means, variances and standard deviations. The parametric procedures employed were appropriate $\underline{t}$ tests, $\underline{F}$ tests, $\underline{z}$ tests and analyses of variance. The nonparametric χ^2 technique was also utilized.

In describing the partially seeing children in terms of a discussion incorporating the case study approach, the relevant and pertinent characteristics of the subjects are described both as these characteristics are found in the group as they appear in individual cases. Three representative case studies are presented in detail.

Chapter V

RESULTS AND DISCUSSION

Statistical Findings

A. Intellectual Ability

There was no significant difference in the mean IQ of the subjects as measured by the Binet in contrast to the verbal IQ obtained from the WISC. The mean Binet IQ was 104 while the mean WISC verbal IQ was 103.

A summary of an analysis of variance of the subtests of the WISC verbal scale is shown in Table 6.

Table 6

ANALYSIS OF VARIANCE SUMMARY
FOR WISC VERBAL SUBTESTS

Source	df	ss	ms	F
Subtests	4	62.45	15.61	3.66**
Subjects	15	305.95	20.40	4.79**
Subtests x Subjects	60	255.55	4.26	
Total	79	623.95		

** significant at the 1% level

An appropriate one tailed F test for the differences among the subtests reached significance at the 1% level which showed that the subjects performed in a significantly different manner on the various subtests. Also the analysis of variance revealed that there were significant differences at the 1% level in the manner in which the various subjects performed on the tests. Inspection of the variances on the individual subtests indicated that the analysis of variance can be interpreted as demonstrating significant differences in the means of the subtests.

Table 7 presents the means of the subjects' scaled scores for the subtests and the absolute differences between these means. Employment of a critical difference test (2 tailed) revealed that there was a significant difference at the 5% level of any two means which had an absolute difference of 1.43 and a significant difference at the 1% level of any two means which had an absolute difference of 1.88.

Table 7

WISC VERBAL SUBTEST MEANS AND DIFFERENCES BETWEEN THEM

Subtests	Infor. ($\bar{x}$ = 9.19)	Compr. ($\bar{x}$ = 9.88)	Arith. ($\bar{x}$ = 10.69)	Simil. ($\bar{x}$ = 11.44)	Vocab. ($\bar{x}$ = 11.44)
Infor. ($\bar{x}$ = 9.19)	00	.69	1.50*	2.25**	2.25**
Compr. ($\bar{x}$ = 9.88)	.69	00	.81	1.56*	1.56*
Arith. ($\bar{x}$ = 10.69)	1.50*	.81	00	.75	.75
Simil. ($\bar{x}$ = 11.44)	2.25**	1.56*	.75	00	00
Vocab. ($\bar{x}$ = 11.44)	2.25**	1.56*	.75	00	00

** significantly different at the 1% level (critical difference of 1.88)
* significantly different at the 5% level (critical difference of 1.43)

Inspection of the table reveals the following differences: the information score differed significantly from the arithmetic score (5% level), similarities score (1% level), and vocabulary score (1% level); the comprehension score differed significantly from the similarity and the vocabulary scores (both 5% level).

B. Achievement

Tables 8 and 9 summarize the results concerning the achievement measures.

Mean difference scores and the t tests computed for these scores are presented in Table 8 which summarizes data concerning the Stanford Achievement Tests, the Gray's Oral Reading Paragraphs and deviations of actual achievement from achievement expectancies.

Inspection of Table 8 reveals that reading achievement as measured by the large print Stanford test showed a statistically significant gain over reading achievement as measured by a comparable form of the small print Stanford test. The gain in arithmetic achievement when large print Stanford tests were used as compared to regular print did not attain statistical significance (.10 of a grade level).

Table 8

MEAN DIFFERENCE SCORES AND t's OF ACHIEVEMENT MEASURES

	Mean gain on lg. print Stanford reading over sm. print Stanford reading	Mean gain on lg. print Stanford arithmetic over sm. print Stanford arithmetic	Mean reading discrepancy between read. expectancy and reading achievement on lg. print Stanford	Mean arith. discrepancy between arithmetic expectancy and arith. achievement on lg. print Stanford	Average discrepancy (arithmetic and reading) between expectancy & achievement on lg. print Stanford	Mean gain on lg. print Stanford reading over lg. print Gray's	Mean reading discrepancy between reading expectancy and reading achievement as measured by lg. print Gray's
Grade Level	+ .43	+ .10	- .46	- .86	- .67	+ .76	-1.41
Obtained *t* from the difference scores	+2.32^{a*}	+ .81^{a}	-1.04^{b}	-2.82^{b**}	-1.85^{b*}	2.77^{a*}	-2.58^{a*}

* significant at 5% level
** significant at 1% level

Notes:
a. 2 tailed tests used because direction of difference not predicted
b. 1 tailed tests used because direction of difference predicted

When reading expectancies were computed by employment of the Horn formulas and compared with reading achievement as measured by the large print Stanford test, an average reading discrepancy of -.46 of a grade level was obtained. However, this was not statistically significant. There was a statistically significant arithmetic discrepancy at the 1% level between achievement expectancy in arithmetic as derived from the Horn formula and actual arithmetic achievement as measured by the large print Stanford test. Partially sighted children were underachieving -.86 of a grade level. Average achievement expectancies were compared to average achievement. The average discrepancy from expectancy was -.67 of a grade level. This attained statistical significance at the 5% level. Thus, when both reading and arithmetic achievement are considered together, the partially seeing children may be described as underachievers. It should be noted that the variances of the different measures compared in Table 8 did not differ significantly from each other and therefore the statistical differences that were noted in various comparisons can be attributed to differences in the means. Hypothesis number 1 predicting that partially seeing children enrolled in a special program are not achieving at a level commensurate with their intellectual potential, therefore, received strong, but not full support from the data.

The performance of the subjects on four subtests of the Monroe Diagnostic Reading Examination is summarized in Table 9.

Table 9

PERFORMANCE ON MONROE READING TEST

	Iota Test		b,d,p,q,u,n Test		Word Discrimination		Sounding Test	
	Number at or above grade level	Number below grade level	Number at or above grade level	Number below grade level	Number at or above grade level	Number below grade level	Number at or above grade level	Number below grade level
	11	3	15	1	7	6	7	3
Total N	14		16		13		10	
χ^2	2.28		12.26**		.08		1.60	
df	1		1		1		1	

** significant beyond the .001 level (2 tailed)

Two tailed χ^2 tests were used with data in Table 9 because the direction of the differences was not predicted. It should be further noted that although the total number of cases in the sample is 16, the total number of subjects listed for the various subtests in the table varies. This is attributable to the fact that the scoring norms on the Monroe tests were not appropriate for the entire sample. Since the norms of the subtests have a low ceiling, it was not possible to determine whether some of the older subjects were performing below or above grade level. The Iota test is concerned with word recognition, the b,d,p,q,u,n Test taps the child's ability to discriminate letters in isolation, the Word Discrimination Test calls for visual discrimination of similar words, and the Sounding Test is concerned with the child's ability to blend sounds. On all four of these subtests there were more subjects performing at or above grade level than subjects performing below grade level. However, this trend was statistically significant only in the case of the b, d, q, u, n Test where the level of significance reached beyond .001.

C. Specific Abilities

The Illinois Test of Psycholinguistic Abilities (ITPA) was administered to subjects whose chronological ages coincided with those of the children who had been used in the standardization of the test. Seven children were given this test. Table 10 presents a summary of an analysis of variance of the nine subtests of the ITPA.

Table 10

ANALYSIS OF VARIANCE SUMMARY FOR ITPA SUBTESTS

Sources	df	ss	ms	F
Subtests	8	18.95	2.37	2.76*
Subjects	6	18.28	3.05	3.55**
Subtests x Subjects	48	41.26	.86	
Total	62	78.49		

* significant at the 5% level (one tailed)
** significant at the 1% level (one tailed)

An appropriate one tailed F test for the differences among the subtests reached the 5% level of statistical significance. Hence, it can be concluded that the subjects manifested significantly different performances on the various subtests. It is further noted that there were statistically significant differences at the 1% level in the manner in which various subjects performed on the nine subtests. Inspection of the variances on the individual subtests indicated that the analysis of variance can be interpreted as demonstrating significant differences in the means of the subtests. The mean of the subjects standard scores (in terms of standard deviations) on the subtests and the absolute differences between these means are presented in Table 11. Employment of a critical difference test (2 tailed) revealed that there was a significant difference at the 5% level of any two means which had an absolute difference of 1.01.

Table 11

ITPA SUBTEST MEANS AND DIFFERENCES BETWEEN THEM

Subtests	auditory vocal automatic ($\bar{x}$= +.41)	visual decoding ($\bar{x}$= -1.08)	motor encoding ($\bar{x}$= -.30)	auditory vocal association ($\bar{x}$= +.17)	visual motor sequencing ($\bar{x}$= .54)	vocal encoding ($\bar{x}$= +.16)	auditory vocal sequencing ($\bar{x}$= +.01)	visual motor associations ($\bar{x}$= -.64)	auditory decoding ($\bar{x}$= +.80)
auditory vocal automatic ($\bar{x}$= +.41)	00	1.49*	.71	.24	.95	.25	.40	1.05*	.39
visual decoding ($\bar{x}$= -1.08)	1.49*	00	.78	1.25*	.54	1.24*	1.07*	.44	1.88*
motor encoding ($\bar{x}$= -.30)	.71	.78	00	.47	.24	.46	.31	.34	1.10*
auditory vocal association ($\bar{x}$= +.17)	.24	1.25*	.47	00	.71	.01	.16	.81	.63
visual motor sequencing ($\bar{x}$= -.54)	.95	.54	.24	.71	00	.70	.55	.10	1.34*
vocal encoding ($\bar{x}$= +.16)	.25	1.24*	.46	.01	.70	00	.15	.80	.64
auditory vocal sequencing ($\bar{x}$= +.01)	.40	1.07*	.31	.16	.55	.15	00	.63	.79
visual motor association ($\bar{x}$= -.64)	1.05*	.44	.34	.81	.10	.80	.63	00	1.44*
auditory decoding ($\bar{x}$= +.80)	.39	1.88*	1.10*	.63	1.34*	.64	.79	1.44*	00

* significantly different at the 5% level (critical difference of 1.01)

Inspection of Table 11 reveals the following differences significant at the 5% level: auditory-vocal automatic differed from visual decoding and visual motor association; visual decoding differed from auditory vocal association, vocal encoding, auditory vocal sequencing and auditory decoding; motor encoding differed from auditory decoding; and visual-motor association differed from auditory decoding. These data support hypothesis number 2, which contends that the psycholinguistic processes involving visual and motor abilities of partially seeing children are significantly inferior to their auditory and vocal abilities. Figure 1 presents a profile of the subjects' average scores on the ITPA subtests.

The subjects' performances on the Benton Test of Visual Memory was analyzed by means of the χ^2 technique. When the performances of the partially sighted children were compared with the norms for normal subjects of their own chronological age and IQ range, it was found that the performances of 5 subjects were below these norms while the performances of 10 subjects were above these norms (the performance of one subject could not be analyzed in these terms since the score was neither above nor below the norms). χ^2 was 1.66 with one degree of freedom. The probability associated with this χ^2 was .10 for a one tailed test. This probability level does not attain statistical significance but shows a definite trend. It must be noted that the trend is in the direction opposite to that stated in hypothesis number 3 predicting that the visual memory of partially seeing children is inferior to that of normal seeing children.

D. Social and Personal Adjustment

The mean social quotient of the subjects as obtained from the Vineland Social Maturity Scale was 106. A _z_ test reveals that this is not significantly different from the social quotient of 100 which is indicative of average social maturity on this scale. The variance of the scores of partially sighted children was not significantly different from the variance of the standardization group. Hypothesis number 4 stating that partially seeing children are less mature than normal seeing children received no support from the data obtained from the Vineland scales.

Table 12 presents the results of the sociometric device and the χ^2 analysis of these results.

Figure 1

MEAN STANDARD SCORE OF SUBJECTS ON ITPA

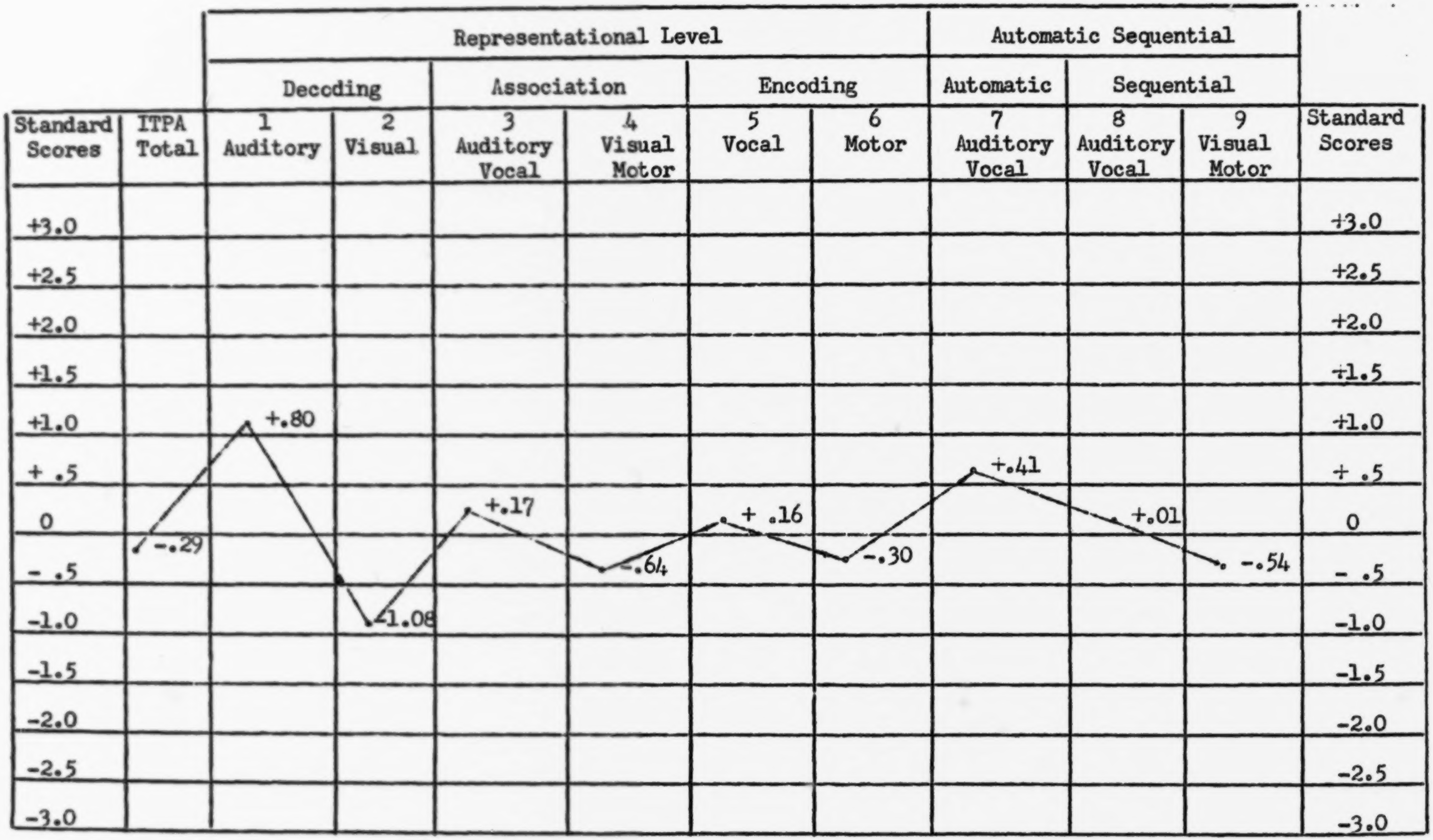

Table 12

χ^2 ANALYSIS OF SOCIOMETRIC RESULTS

	#1 Movies		#2 Play Outdoors		#3 Play Indoors		#4 Records		#5 Ball Game		#6 Week-end		#7 Talk		#8 Party		#9 Painting		Total Scale	
	Below Aver	Aver or Above	Below Aver	Aver or Above	Below Aver	Aver or Above	Below Aver	Aver or Above	Below Aver	Aver or Above	Below Aver	Aver or Above	Below Aver	Aver or Above	Below Aver	Aver or Above	Below Aver	Aver or Above	Below Aver	Aver or Above
No. of Ss	10	0	8	2	7	3	8	2	8	2	9	1	7	3	9	1	8	2	10	0
Total N	10		10		10		10		10		10		10		10		10		10	
x^2	10**		3.60*		1.60		3.60*		3.60*		6.40**		1.60		6.40**		3.60*		10**	
df	1		1		1		1		1		1		1		1		1		1	

** significant beyond the 1% level (1 tailed)
* significant beyond the 5% level (1 tailed)

The sociometric device was administered to all the children enrolled in the same regular classroom as the partially sighted child. Only the 10 subjects enrolled in grade school were involved since the other 6 subjects were enrolled in classes at the junior high school and their classmates were frequently different for various academic subjects. Hence use of the sociometric device at the junior high level was not believed to be comparable. In analyzing the results of the sociometric devices, each child was assigned 3 points for every time he was a first choice, 2 points for every time he was a second choice, and 1 point for every time he was a third choice. The average score for the class was then computed for each individual item on the scale and also for the total scale which consists of all the 9 items considered as a whole. The score of the partially sighted child was compared with the average score and then classified as either below average, or as average or above.

Inspection of Table 12 shows that generally the partially seeing children were not chosen as associates for various activities as frequently as were their normal seeing peers. The number of partially seeing children receiving scores of below average acceptance reached statistical significance at the 1% level for the number of times they were chosen on the following questions: With whom would you like to go to the movies? If you were going on a week-end trip with your parents and could take a friend, whom would you like to take? If you were having a party, whom would you like to invite? The number of partially seeing children receiving below average acceptance reached statistical significance at the 5% level for the number of times they were chosen on the following questions: On a nice summer day with whom would you like to play outdoors? With whom would you like to listen to records? If you were going to see a ball game, with whom would you like to go? If you were painting Christmas decorations, with whom would you like to work? When the whole scale scores of the partially sighted children were compared with average scores for the total scale, all ten subjects received scores which were below average. This incidence of occurrence was significant beyond the 1% level of confidence.

The x^2 tests used in analyzing the sociometric information were all one tailed tests because the direction of the differences was predicted. Hypothesis number 5 stating that partially seeing children are less well accepted in regular classes than their normal seeing peers received support from these data.

The results from the Claifornia Test of Personality and the x^2 analysis of these results are summarized in Table 13.

Table 13

χ^2 ANALYSIS OF RESULTS FROM CALIFORNIA TEST OF PERSONALITY

		No. of Ss	Total N	χ^2	df
Total Adj	50 or above	10	16	1	1
	49 or below	6			
Total Social Adj	50 or above	12	16	4*	1
	49 or below	4			
Community Relations	50 or above	6	16	1	1
	49 or below	10			
School Relations	50 or above	9	16	.26	1
	49 or below	7			
Family Relations	50 or above	12	16	4*	1
	49 or below	4			
Anti-Social	50 or above	12	16	4*	1
	49 or below	4			
Social Skills	50 or above	13	16	6.26**	1
	49 or below	3			
Social Standards	50 or above	14	16	9**	1
	49 or below	2			
Total Personal Adj	50 or above	7	16	.26	1
	49 or below	9			
Nervous Symptoms	50 or above	7	16	.26	1
	49 or below	9			
Withdrawal	50 or above	9	16	.26	1
	49 or below	7			
Feeling of Belonging	50 or above	9	16	.26	1
	49 or below	7			
Sense of Freedom	50 or above	11	16	2.26^a	1
	49 or below	5			
Personal Worth	50 or above	12	16	4*	1
	49 or below	4			
Self Reliance	50 or above	7	16	.26	1
	49 or below	9			

** significant beyond the 1% level of confidence (1 tailed)
* significant beyond the 5% level of confidence (1 tailed)
a significant beyond the 10% level of confidence (1 tailed)

It should be noted that the California Test is scored in terms of percentiles. In analyzing the data the percentile scores of the partially sighted children were classified as falling either at the 49th percentile or at the 50th percentile or above. Better adjustment is supposedly indicated by higher percentile scores. It is important to note that although statistical significance was attained on several of the scales, the direction of the differences in all cases was in the direction opposite to that predicted by the hypothesis. On the following scales there were a significantly larger number of partially seeing children whose scores fell at or above the 50th percentile than the number of those whose scores fell below this percentile: social standards and social skills (both beyond the 1% level) and feeling of personal worth, anti-social tendencies, family relations and total social adjustment (all beyond the 5% level). On the sense of freedom scale the number of subjects at or above the 50th percentile as compared to those below this percentile reached a significant level beyond that of 10% which indicated a definite trend. In all cases of χ^2 analysis, 1 tailed tests were used since the direction of the differences was predicted. Hypothesis number 6 that partially seeing children manifest poorer personality adjustment than children who have normal vision did not receive support from the data obtained from the California Test of Personality, because the results were significant but in the direction opposite to that predicted by the hypothesis.

Discussion of Findings

A. Intellectual Ability

The results of this study revealed that as a group the partially sighted children were of average intellectual ability. This finding is in agreement with the recent research of Bateman (1962). This remains true whether their intellectual functioning is measured by the Binet or the verbal scale of the WISC. It is to be expected that children enrolled in Illinois programs for the "partially sighted" will have average or above average intelligence. One of the criterion for eligibility for such a program in the state of Illinois is that the child be of "sound mind." This has been interpreted to mean that children who are mentally handicapped are not eligible for this special program. In terms of IQ this means that children must have an IQ of 80 or above to be included in the program for the partially sighted. The Binet IQs of the subjects ranged from 86 to 147 and the WISC verbal IQs range from 87 to 126. It has been found that for children whose intelligence fall in the normal and upper ranges, of intelligence, with chronological ages below 10, the WISC is generally lower than the Binet IQ (Littell, 1960). In this study the WISC verbal IQ was not lower than the Binet IQ in the majority of cases where intelligence fell within the normal range but there was a tendency for children in the upper ranges of intelligence to score lower on the verbal section of the WISC than on the Binet. This is consistent with research findings comparing the WISC and the Binet (Littell, 1960). The number of subjects in this study was not large enough to render it feasible or valid to make a detailed comparison of the WISC verbal scale and the Binet. If the WISC performance scale had been used and a full scale WISC IQ obtained, the relationship between the Binet IQ and WISC full scale IQs might have been somewhat different than the relationship between the Binet IQs and the WISC verbal IQs. The verbal scale of the WISC was used in this study because it was believed that the verbal scale would be a better predictor of school success than the performance scale for these handicapped children.

Data concerning the performance of the subjects on the WISC subtest showed that there was a significant difference in the way the different subjects performed on these tests. This was to be expected since the subjects were of different intellectual ability. The data further revealed that there was a consistent and significant tendency for the subjects to do better on the similarities and vocabulary subtests and to do poorest on the information and comprehension subtests. If the vocabulary subtest is viewed as an index of verbal ability, the similarities subtest as an index of conceptual ability, and the information subtest as a measure of the degree of which an individual has profited from exposure to common experience and education, then the results might indicate some interesting implications (Wechsler Adult Intelligence Scale, 1951). The data of this study could imply that while partially sighted children have good conceptual ability and vocabulary development, they are not as adept in recalling information to which they have been exposed in their experiences and education. However, the authors believe that much more research and clarification is needed before one can generalize from these findings. These findings may be of no practical significance if they represent an artifact involving the reliabilities and validities of the subtests. The reliability of the WISC subtests vary from age to age and in some cases are rather low. Then, too, the literature offers little interpretation of

WISC subtests beyond the statement that they seem to measure different factors in children than adults. Evidence suggests that even within the adult scales the subtests do not measure the same factors at all age levels (Littell, 1960). Hence, an interpretation of the different performance on various subtests lacks clarity and empirical evidence that such differences represent actual and significant differences in the way the children function in different areas. The scaled scores at each age level and for each separate subtest have a mean of 10 and a standard deviation of 3. The mean scaled information score of the subjects was 9.19 and their mean comprehension scaled score was 9.88, whereas their mean similarities and vocabulary scaled scores were 11.44. While the differences in these scores attained statistical significance, none of them are markedly above or below the mean of 10. Therefore, any strengths or weaknesses of practical significance in their pattern of performance on the verbal section of the WISC is open to question.

B. Achievement

Reading achievement as measured by large print Stanford Achievement Tests (16 point) showed a significant gain at the 5% level over reading achievement as measured by regular print Stanford tests (10 point). The mean gain was .43 of a grade level. A gain of .43 may not in inself be of too much concern to educators but it should be noted that in 7 of the 16 cases the gain was over .80 of a grade level. One subject's gain was 1.8. Therefore, it appears that large print achievement tests are better suited to measure the reading achievement of partially sighted children.

The mean arithmetic score when a large print achievement test was used revealed a gain of only .10 of a grade level which was neither practically nor statistically significant. When both reading and arithmetic are considered together there is a case for using large size print. These children may read large print with more comfort and less fatigue.

The hypothesis that partially seeing children enrolled in a special program are not achieving at a level commensurate with their intellectual potential received some support from the data. The mean discrepancy between reading expectancy and achievement (measured by the large print Stanford test) was -.46 of a grade level, but this did not attain statistical significance. However, there was much individual variation in the amount of underachievement which ranged from -.3 of a grade level to -5.0 grade levels. Inspection of the data revealed that in some individual cases the underachievement was marked. It should be pointed out that the subjects tended to perform better on the reading section of the large print Stanford test (16 point) than on the large print Gray's Oral Reading Test (18 point). The average gain was .76 of a grade level and was significant at the 5% level. Although the Gray's test does not measure comprehension, many errors that are not noted in the Stanford test because it involves silent reading only are observed on the Gray's test which affect the scoring. Deficiencies in the mechanics of reading seemingly penalizes the child's reading score on the Gray's more than on the Stanford Test. It appears that the results of the Stanford test places the child on his frustration level in reading while the Gray's score indicates his instructional level of reading. Errors such as omissions, mispronunciations, substitutions, repetitions, and reversals all affect the scoring on the Gray's. If the subjects' reading expectancies are compared with reading achievement as measured by the Gray's, the average amount of underachievement is -1.41 of a grade level. This finding is significant at the 5% level of confidence. Using reading achievement on the Gray's as a criterion of achievement, the hypothesis concerning the underachievement of the subjects is supported. As a group the partially sighted children are underachieving in oral reading.

Data concerning arithmetic achievement (as measured by the large print Stanford test) lent positive and significant support to the hypothesis that partially seeing children are not achieving at a level commensurate with their intellectual potential. The mean discrepancy between expectancy and achievement was -.86 of a grade level. This reached significance at the 1% level of confidence. Of the 16 subjects in the sample, twelve were underachieving in arithmetic. The amount of underachievement ranged from -.3 to -4.0 grade levels. Partially seeing children according to these findings are having difficulty in arithmetic. Perhaps number concepts are harder for them to learn or perhaps the program for partially seeing children does not place as much emphasis upon arithmetic as upon other academic skills.

When arithmetic and reading expectancies for each child were averaged to obtain an average expectancy and when the average expectancy was compared to the achievement average of the arithmetic and reading achievement (from the large print Stanford test) the subjects manifested an average discrepancy of -.67 of a grade placement below expectancy. This discrepancy reached statistical significance at the 5% level. Thus, when both arithmetic and reading are taken into consideration, the hypothesis that partially seeing children are not achieving at a level commensurate with their intellectual potential is supported. When the Stanford large print tests were used as measures of achievement, the greatest amount of underachievement appeared in the area of arithmetic. Although the amount of underachievement in reading did not attain statistical significance, there was a definite trend in this direction. When both arithmetic and reading are considered together the data supported the contention that partially seeing children are not achieving at a level commensurate with their intellectual ability.

These findings are contrary to some findings of the previous research such as those of Peck (1933). She found that the majority of the subjects were above grade level in silent reading. However, she only took grade placement into consideration and did not consider either the mental or chronological ages of her subjects. Bateman's findings (1962) on both silent and oral reading are in agreement with the findings of this study.

On four subtests of the Monroe Diagnostic Reading Examination, there were more children who performed at or above grade level than those who performed below grade level. However, this incidence of occurrence reached statistical significance only in the case of the b,d,q,u,n Test which is concerned with the child's ability to discriminate letters in isolation. The other three tests were concerned with word recognition, word discrimination and sound blending. These data seem to indicate that the partially seeing children did not have severe difficulties with these separate aspects of reading tapped by the Monroe test. It was noted earlier that the subjects were unachieving in oral reading as measured by the Gray's test. This is possibly attributed to the fact that scoring on the Gray's takes into account many reading errors, of a mechanical nature for which the child is not penalized so heavily on the Stanford silent reading test. The

Gray's test evaluates reading skills in a meaningful reading context while the Monroe subtest are concerned with testing a few specific skills closely related to reading but not in an actual reading context. Reading difficulties such as repetition, addition, omission and substitution of words affects a child's reading efficiency and depresses his score on the Gray's test but not on the Monroe test. The Stanford test seems to place a child at his frustration level, the Gray's at his actual instructional level, while the Monroe test evaluates his level on specific skills related to reading. It should be noted that there were some children who performed below grade level on the Monroe tests and these children appeared to have rather severe reading disabilities. As will be discussed later, partially seeing children manifested many visual and motor difficulties on the Illinois Test of Psycholinguistic Abilities (ITPA). Perhaps this can be accounted for by the fact that the ITPA seems to measure more global visual abilities whereas the Monroe test tap those visual abilities which are more specifically related to reading. Then, too, it appears that these children receive considerable training in visual discrimination abilities needed for reading. It may be that these children have difficulties with tasks involving visual abilities but these difficulties are not so manifest in visual abilities concerned with reading because they have received considerable training in this particular area.

C. Specific Abilities

The performance of the subjects on the ITPA revealed some very definite information concerning their strengths and weaknesses in various areas of psycholinguistic abilities. The results of the analysis of variance showed that the individual variation in performance from one subject to another differed significantly as might be expected. However, as a group the subjects showed some consistent and significant patterns of performance on different subtests of the ITPA. Generally these children performed at an average or above average level on tests involving auditory and vocal abilities. In all cases where visual and motor abilities were involved, the subjects' performance were below average. Their difficulty was especially manifested on the visual decoding, visual motor sequencing, and visual motor association subtests. The average standard score for the group on the visual decoding test was -1.08. (It should be remembered that on the ITPA the standard scores are given in terms of standard deviations.) According to McCarthy and Kirk (1961) this test taps the child's ability to obtain meaning from visual linguistic stimuli. The data strongly indicates that the partially sighted children have difficulty interpreting linquistic stimuli that they receive through the channel of vision. As previously noted, the subjects did not show too much difficulty with visual stimuli related to reading as tapped by the Monroe subtests. However, on the ITPA visual decoding test where a more global visual ability seemed to be sampled, these children manifested inferior performance. The visual-motor sequencing subtest requires the child to duplicate the order of a sequence of geometrical designs first presented to him and then removed. The authors (McCarthy and Kirk, 1961) describe this subtest as the ability to correctly reporduce a sequence of symbols previously seen. The average standard score for the subjects on this particular subtest was -.54 which again indicates inferior performance. On the visual-motor association subtest, the average standard score for the group was -.64, manifesting below average performance in this area also. This subtest requires the subject to select from among a set of pictures the one which most meaningfully relates to a given stimulus picture. The subtest is viewed as measuring one's ability to relate meaningful visual symbols (McCarthy and Kirk, 1961).

The subjects performed at an average or above average level on ITPA subtests involving auditory and/or vocal abilities. There best performance was on the auditory decoding and auditory-vocal automatic subtests. The auditory decoding subtest involves the child's ability to comprehend the spoken work and the auditory-vocal automatic subtest measures the child's ability to predict future linguistic events from past experience (McCarthy and Kirk, 1961). The authors explain that this latter test is called "automatic" because it is usually done without conscious effort as, for example, in listening to a speech, we develop an expectation for what will be said which is based on what has already been said. The subjects had an average standard score of +.80 on the auditory decoding test and an average standard score of +.41 on the auditory-vocal automatic subtest. It is not surprising that the partially seeing children manifested average or above average abilities in auditory and vocal areas since their instruction in the special program emphasizes training in listening and oral discussion of their work.

The data from the ITPA supports hypothesis number 2 which states that the psycholinguistic processes involving visual and motor abilities of partially seeing children are inferior to their auditory and vocal abilities. These findings are in essential agreement with those of Bateman (1961) who administered the ITPA to 93 partially seeing children. When the visual motor abilities of these children are compared to their auditory and vocal abilities, their performance in visual and motor areas is significantly inferior to their performance in auditory and vocal areas. On the total ITPA scale, the subjects obtained an average standard score of -.29.

Hypothesis number 3 contends that the visual memory of partially seeing children is inferior to that of normal seeing children. This was not supported by the data. When the performances of the subjects were compared with the norms for normal subjects of their own chronological age and IQ range, 10 of the subjects performed above the norms while only 5 performed below the norms. The probability associated with this occurence was .10 for a one tailed x^2 test. But as it is readily observable, the trend is in the opposite direction to that predicted by the hypothesis. These results are contradictory to expectancy and are difficult to explain in view of the ITPA findings that indicate partially seeing children have difficulties with visual material. Perhaps this can be accounted for by the fact that the Benton test is mainly concerned with visual memory while the ITPA seems to measure visual abilities as they are related to communication and language processes. Thus, partially seeing children may not have too much difficulty with visual memory per se but they do seem to have considerably more difficulty when visual ability has a close relationship with communication processes. Then too, maybe the Benton test does not assess the finer elements of visual abilities and thus partially sighted children are able to do quite well with the more gross types of abilities measured by the test.

D. Social and Personal Adjustment

That partially seeing children are less socially mature than normal seeing children. is the contention of hypothesis number 4. The data give no confirmation to this hypothesis since the mean social quotient for the group was 106. In this study the subjects served as their own informants. Although Doll (1947) states that this procedure can be used, he also warns that results obtained in this way should be carefully scrutinized. In view of the findings relating to the performance of the subjects on other self-reporting techniques (specifically the California Test of Personality), it seems questionable whether the data obtained from the Vineland presents a realistic picture of the social maturity of these children. As will be discussed later, analysis of case studies indicates that as a group partially seeing children are less mature and less well adjusted emotionally than their normal seeing peers. Yet, on self-report techniques these children tend to report themselves as better adjusted than average normally seeing children. One wonders if this assertion of social maturity is not a facade masking actual immaturity in this area.

Hypothesis number 5 states that partially seeing children are less well accepted in regular classes than their normal seeing peers. This hypothesis received strong support from the results of the sociometric device. Every one of the 10 partially seeing subjects enrolled in the sociometric study received an acceptance score of below average on the total scale. This incidence of occurrence was significant at the 1% level. In the majority of cases, the average score of the partially seeing child for the whole scale was very markedly below the average total scale score for their normally seeing classmates.

On seven of the nine situations depicted on the scale, the larger number of subjects with below average scores was statistically significant as compared with the smaller number who had average or better scores. On the two remaining questions, there were still more partially seeing children with below average scores than those with average or above scores although this incidence of occurrence did not attain statistical significance.

The partially seeing subjects were excluded the most on situations that would involve attending the moview with them, taking them on a family week-end trip, and inviting them to a party. Seemingly taking a friend on a family week-end trip would indicate a rather high level of friendship. Five of the partially seeing subjects were not even chosen by anyone to share this experience with them. The other four who had below average acceptance in this area had low scores when compared to the average score of their classmates. Since the partially seeing children were very infrequently chosen to be invited to a party, it may be that these children are not regarded by their classmates as possessing social skills which would render them good party participants. The visual problems of partially seeing children might have been a factor responsible for their exclusion in a situation involving attending movies with their classmates.

The four additional situations on which the subjects were excluded to a significant degree included situations that called for playing outdoors, listening to records, seeing a ball game and painting decorations in school. Outdoor activities may suggest physical vigor to children and the partially seeing children may be viewed as lacking in this area. The factor of visual difficulties may be associated with the subjects' exclusion as companions in seeing a ball game. The subjects were also excluded in a situation involving painting decorations. Perhaps underachievement in school enters in as a factor and is generalized to other school activities, conveying to other children the idea that partially seeing children are inadequate in the performance of school work. It is difficult to hypothesize why partially sighted children had below average acceptance in a situation where they would be listening to records with a friend.

The only two situations where the number of partially seeing children receiving below average acceptance was not statistically significant depicted a situation that involved playing indoors and another situation which asked the children to choose those they would enjoy talking to about any subject they desired. When the sociometric scale was devised it was believed that the question "If you could talk with someone and if you could talk about anything you wanted, whom would you choose?" - would call for a high level of friendship and that the partially seeing children would be greatly excluded in this area. However, the results show that their exclusion in this situation was not as extreme as expected. It appears that although the activity of enjoying talking to someone might indicate a close friendship for adults, this does not necessarily hold true with younger children. Seemingly playing indoor games with someone and talking to them does not demand too much personal involvement for children and thus they tend to include partially seeing children in this activity.

The data from the sociometric technique strongly indicates that the partially sighted children have been excluded as desirable companions in many areas of social interaction with other children. It cannot be said that the partially sighted children are rejected. Normal seeing children may not have felt opposed to partially sighted children but the data indicate that generally these children are excluded and the type of acceptance they have is limited. Why they have a limited type of acceptance and why they have been excluded in many situations is not answered by this research. Many factors may account for the results of the sociometric technique. In some cases children with partial vision have visual difficulties such as strabismus which detract from their physical appearance. Then too, children with handicaps frequently feel that they are different from other children and this may cause them to be hesitant in attempting to establish close relationships with their normal seeing peers for fear that they will not be accepted. This could lead to a lack of normal social experiences which could in turn lead to social inadequacies. Then too, the majority of the children in the sample did not reside in the neighborhood served by the school they were attending. They were transported to this particular school because the partially sighted program had been established there. Knowing this, the normally seeing children may not have given the partially sighted children the same consideration as other children who were not only classmates but who also lived nearer to them. Since they do not live in the district served by the school, partially seeing children do not have too many opportunities to form after school play groups with their classmates and hence they are limited in this particular opportunity to form close social relationships. Whatever the reason may be for the partially sighted child's limited acceptance, the results of this study certainly indicates that more efforts should be made to better integrate these children in the regular classroom.

Hypothesis number 6 contends that partially seeing children manifest poorer personality adjustment than children who have normal vision. Data from the California Test of Personality did not support this contention. On five of the subtests the number of partially seeing children whose scores fall at the 50th percentile or above (thus indicating better adjustment than 50% of the standardization group) was more than the number of children whose scores fell at or below the 49th percentile. This incidence of occurrence was statistically significant. These data not only do not support the hypothesis concerning the personality adjustment of partially seeing children but also imply that this group of children are quite well adjusted when compared with a normal population of children. On the following scales the number of subjects presenting themselves as fairly well adjusted was statistically significant compared to the number reporting themselves as less well adjusted: feelings of personal worth, social standards, social skills, anti-social tendencies, family relations and total social adjustment. There was also a tendency for the children to report themselves as well adjusted on the sense of personal freedom scale ($p = .10$). These results are not only contradictory to the hypothesis but are also opposed to information received from the sociometric device and the case studies which indicate that these children have considerable social difficulties and emotional difficulties as well. It appears that the California Personality Test tended to measure the manner in which the child desired to present himself rather than the actual way the child felt about himself. The subjects presented themselves as perceiving their social skills and total social adjustment as being very satisfactory. Yet the sociometric technique has given positive evidence that in the regular classroom, partially seeing children have below average acceptance. It may be argued that while others see the partially seeing children as socially inadequate, they themselves have a more favorable perception of their social adjustment. This may be true to some extent and in some cases. However, the extent to which some of the subjects were so markedly excluded on the sociometric device by their classmates seems to indicate that in some instances their lack of social acceptance must be so obvious that these children could hardly fail to be aware of this social exclusion. Then too, the case studies reveal that some of the children have emotional difficulties which appear to be related to their problems of socialization. It seems likely then that these children try to present themselves as feeling well satisfied with their emotional and social adjustment and that this presentation serves as a facade to mask actual feelings of inferiority in social and emotional areas.

It seems highly probable that in this study results from the California test were not true indicators of the actual personal and social adjustment of the partially seeing children. This test is a self report inventory and as such is subject to malingering and distortions due to the examinee's false perceptions about himself. Unlike some other self-report personality tests, the California test does not have a built in scale to check the validity of the examinee's responses. At any rate the results obtained from the California test are valuable in that they present a picture of how partially seeing children present themselves on a self-report inventory. Other data strongly indicate that the subjects were not as well adjusted as they tended to present themselves. Whether the subjects' reports of good adjustment are due to malingering or actual misconceptions about themselves cannot be definitely determined. However, the important fact is that they do seem to misrepresent the adequacy of their social and emotional adjustment and this in itself is psychologically significant.

Then too, the actual reliability of the California test is somewhat questionable since each scale consists of only twelve items. If a subject answers only three questions on a scale differently from the way another subject answers these questions, their percentile scores for that scale can differ as much as thirty points. It appears that at times these percentile scores lend themselves to somewhat ambiguous interpretations making differences appear more gross than they actually are.

It is interesting to observe that on two scales of the California test, more subjects had scores below the 49th percentile than those having scores at the 50th percentile or better. Although this incidence of occurrence did not attain statistical significance, there was still a tendency for partially sighted children to report considerable nervous symptoms and to report rather unsatisfactory relationships with their neighbors on the community relations scale in that they either did not enjoy their neighbors and neighborhood activities or they did not have the opportunity to mingle happily with them. It is not clear why the subjects reported themselves as less well adjusted on these two scales whereas they reported themselves as well adjusted on all the other scales. Perhaps the items on these scales were not as ego threatening as questions on the other subjects.

Chapter VI

CASE STUDIES

Rationale for Use of Case Studies

The case studies of the partially sighted children have been analyzed to render additional and supplementary information concerning some of the factors associated with the adjustment of this group of children. As a result of this present research a large amount of quantitative and qualitative information delineating the specific needs of each partially seeing youngster has been added to the already existing individual case studies. It has been possible to formulate an intensive, individualized educational treatment program for each child based upon his specific needs delineated by the present research and recorded in his composite case study. Careful consideration of all the quantitative and qualitative data recorded in the partially sighted child's case study has enabled the researchers to formulate for each child a specific educational treatment program and intensive individual and group casework to help the child overcome and/or compensate for his adjustment difficulties. Phase II of this research project will concern itself with evaluating the effectiveness of this treatment program in facilitating the total adjustment of this group of handicapped children.

Summary of Case Study Findings

An analysis of the detailed case study of each partially seeing child has rendered additional information concerning the adjustment of partially sighted children. This analysis mainly utilized qualitative data although quantitative data in the form of scores on various tests were used to help evaluate qualitative information. Psychological reports, teacher observations, social workers reports, parent interview material and projective techniques were the main components of the qualitative data used in the analysis. Six of the total group of sixteen subjects displayed severe adjustment problems, six others manifested moderate adjustment difficulties, while the remaining four children displayed adequate total adjustment, although they, too, had some mild adjustment problems in specific areas.

The better adjusted children tended to feel a closer relationship with their parents, manifested more self-reliance and independence, participated in more normal peer associations and related better with other people than did the more severely maladjusted group.

The main manifestations of the adjustment difficulties of these children which occurred most frequently were the following: (1) poor peer relationships frequently associated with a minimal amount of social contact with other children and feelings of isolation in groups; (2) fear of failure and lack of confidence in academic tasks associated with concern about poor school performance; (3) social immaturity and a preference for playmates of a younger chronological age; (4) a need for reassurance as to their genuine acceptance by their parents which appeared to be frequently associated with feelings that adults in general show little real understanding of their difficulties; (5) lack of feelings of personal adequacy; (6) poor motor coordination observed by teachers who saw this as an obstacle to types of school achievement; and (7) withdrawal tendencies which took the form of reticence in social situations and a hesitancy to put forth their best efforts in attacking academic tasks.

Other characteristics which were also manifested but in less frequency were as follows: (1) high manifest anxiety; (2) difficulty in concentrating and maintaining an adequate attention span; and (3) feelings of hostility and resentment.

Case Studies

The following three case studies were selected as being representative of partially seeing children. Besides giving all the diagnostic information in each case, the researchers have included the treatment program based upon the differential diagnosis. Although the effectiveness of the treatment will not be evaluated until Phase II of this study to exemplify the use of the individual diagnosis material. The three case studies manifest some of the diversified difficulties various partially seeing children experience. The visual acuity in the better eye after refraction varies for the three cases. In the first case, the visual acuity is 20/20, in the second case it is 20/70, and in the last case it is less than 20/200. While the first child has 20/20 visual acuity, he has severe visual problems which render him eligible for the special program.

Case of Mike

I. Diagnostic Information

Reason for Referral

Mike was called to the attention of special services personnel when he was in the third grade. The referral difficulty involved Mike's low academic achievement and his lack of alertness even though his IQs on group tests indicated average intellectual ability.

Background Information

Social History

Mike is the oldest of three children born to parents of average socioeconomic status. The father is an insurance salesman while the mother confines her duties to the home. Mike's younger brother is in the first grade; his younger sister is three years of age. The mother received some services from the local mental health clinic but it was their opinion that treatment of her emotional problems would necessitate hospitalization if it were to be successful. It is reported that the mother does not have much control over the children and provides them with little supervision. The social worker who has interviewed the family reports that the father has almost completely removed himself from sharing family responsibilities. The family have resisted efforts attempting to obtain psychological help for them.

At home, Mike has no regular responsibilities or chores although he carries out occasional chores willingly. He reports that he does not engage in a usual amount of social activities for a boy of his chronological age. Mike reveals that he has only one close friend in school and none in his immediate neighborhood. He has compensated for this in part by developing interests at home. Included among these are typing and building model cars. At school he enjoys art work. Mike also relates that he spends at least four hours daily viewing TV.

Medical History

No complicating factors were reported in the birth and pregnancy. Mike accomplished various developmental tasks such as sitting alone, walking and talking at normal ages. Medical examination discloses that Mike is in satisfactory health although he frequently complains of headaches and worries about his health. His physical size is average for his chronological age.

Mike's visual difficulties were diagnosed by an ophthalmologist. His visual problems were described as amblyopia in the right eye with alternating esotropia and congenital overaction of the muscles. Without correction his visual acuity is 20/400 in the right eye and 20/25-2 in the left eye. The visual acuity in his right eye does not lend itself to correction by refraction, but the acuity in his left eye has been corrected to 20/20. The ophthalmologist recommended that Mike receive specialized help in school for his visual difficulties. Mike passed the school hearing screening test without any difficulty.

School History

Mike entered school at the average age of six. His achievement was poor from the very beginning, especially in the area of reading. It was also noted by the teacher that Mike had difficulty concentrating and was not mentally alert in the classroom. In the early grades Mike frequently complained of not feeling well. He was absent from school more often than the average child. Many of the symptoms Mike complained about were vague. His mother explained to the teacher that Mike had a fear of cancer. In consequence of his poor academic achievement, Mike repeated the second grade. His work was still very poor in the third grade and at the end of this school year he was referred to the school psychologist for an examination. This psycho-educational study reviewed Mike's eligibility for placement in the program for the partially seeing. Mike entered this program at the beginning of the fourth grade. He was still enrolled in the regular classroom but each day he spent time in the special class where he received specialized instruction.

When Mike entered the program he was, for all practical purposes, a non-reader. He had lost much self-confidence and was so educationally retarded that he repeated the fourth grade also. In the special program the teacher concentrated on helping Mike with reading and spelling since he experienced the most difficulty in these areas. He was also given special help in the area of arithmetic.

At the time of this study Mike is in the sixth grade. He has made considerable progress in spelling and has also improved in writing sentences and paragraphs. Mike still experiences considerable difficulty in the area of reading although he has shown progress with this skill. Spelling is also very difficult for him. His ability to blend sounds has improved and falls within the normal range, but he continues to have marked difficulty with word discrimination. The special teacher notes that Mike lacks much information ordinarily acquired through schooling. The fact that he is a poor reader likely contributes to this. His regular teacher has been pleased with his progress in arithmetic. The special teacher notes that Mike has acquired skill in using the typewriter.

Psychological Findings

Mike has received two complete psychological evaluations, one upon his entry into the program and the other three years later. The school psychologist who most recently examined him reported the following:

Mike is a friendly, neat appearing youngster who was cooperative throughout the diagnostic session. He gives the clinical impression of being a rather feminine, non-aggressive sort of youngster. On the whole, he made good social contact and manifested better than average social confidence in the diagnostic situation. He responded well to praise and encouragement, a fact which is worthwhile recalling when approaching Mike.

The present assessment of Mike's intellectual ability places him within the average range. On the Binet intelligence test he obtained an IQ of 100, his chronological age being 12 years, 8 months, and his mental age 12 years, 10 months. Currently his mental ability is adequate for work on a seventh grade level but Mike can not be expected to achieve at this level because of his marked academic retardation. Eventhough he has a marked reading deficiency, Mike's performance on the Binet placed his vocabulary development at the 14 year old level.

At the time of this examination, Mike earned a grade placement of 1.6 on the Gray's Oral Reading Paragraphs Test. His performance on diagnostic reading tests evidenced such errors as omissions, repetitions, and reversal tendencies. Mike's sight vocabulary is limited, his rate of reading is painfully slow, and he becomes easily fatigued. At times he follows along the line of print with his fingers, presumably to keep his place. Mike's difficulty in reading seems to be associated with his visual defect which makes it extremely difficult for him to perceive a clear image of a word. On the positive side, however, it should be noted that Mike has developed satisfactory skills in the areas of sound blending, and auditory discrimination. However, he has marked difficulty associating sounds with the printed symbol. There is a wide discrepancy between his reading mechanics and reading comprehension in favor of the latter. Even his reading comprehension is markedly below grade level.

On the arithmetic section of the Wide Range Achievement Test, Mike earned a grade placement of 4.6. He can handle both arithmetic and subtraction satisfactorily, but he can only perform elementary problems in the area of multiplication and division.

Psychologically, Mike appears to be experiencing emotional stresses which he is unable to discuss at this time. He is the type of youngster who is unwilling to admit that all is not going well with him. His unstable home environment and what appears to be a strong but unhealthy identification with his mother are factors which are associated with his emotional difficulties. Mike is concerned about his poor school performance and somewhat bewildered by his inability to learn to read. He needs help in overcoming his negative attitude toward reading.

Mike's visual difficulties together with his academic disabilities continue to render him eligible for the program for partially seeing children where he will require much individualized help from a special teacher.

Information From Tests Given For This Study

Mike's obtained IQ on the WISC verbal scale was 95. This does not differ appreciably from his Binet IQ of 100. On the WISC verbal subtests he did his best on similarities, vocabulary and comprehension, and his poorest in the areas of arithmetic and information. He obtained a grade placement of 2.4 on the regular print Stanford reading test and a grade placement of 3.5 on a comparable form of the Stanford reading test in large print. In arithmetic Mike obtained a grade placement of

3.6 on the regular print Stanford test and a grade placement of 4.5 on the large print test. On the Gray's reading test, his grade placement was 2.1. On the subtests of the Monroe reading examination, his grade placements were 4.0 on the Iota Test and 4.4 on the Word Discrimination Test. On the b, d, p, q, u, n Test he performed within the normal range and his sound blending ability was normal. According to the Horn formulas, Mike should be achieving at a grade level of 8.5 in both reading and arithmetic. By this criteria he is markedly underachieving.

In the area of specific abilities, Mike's performance on the Benton Test of Visual Retention was below average but not markedly so. The ITPA was not administered to Mike because his chronological age was older than children on whom the test was standardized.

On the sociometric device Mike was not chosen a single time on any item by his classmates. Thus, his total score of zero compares very poorly with the total mean score for the class which was 51.

Mike's scores on the California Test of Personality except on three subtests, the withdrawal tendencies subtest (60th percentile), nervous symptoms subtest (50th percentile) and the subtest on social skills (70th percentile) were below average. He scored very poorly on the anti-social tendencies scale (10th percentile) and the self-reliance scale (20th percentile). Mike's social quotient on the Vineland was only 77.

Mike's stories on the Michigan Picture Test were very guarded and he was reluctant to develop any particular themes in his stories. His stories did, however, reveal anxiety concerning poor school achievement as well as insecurity in familial relationships.

II. Recommended Educational Treatment Based on Complete Differential Diagnosis

From the findings, it would appear that Mike would spend approximately one-half of his time in the resource room receiving special help in the following areas of specific weaknesses.

Reading

Mike is markedly retarded in reading. He has difficulty in remembering words by sight. His learning disability is in the area of visual-auditory association where he has marked deficiencies in ability to associate sounds with the printed symbol. It is suggested that a kinesthetic - tactile-auditory approach be used in helping him overcome this difficulty. The basic text in reading used at his grade level is much too difficult to use for instructional purposes. Using primary level basic readers does not seem to be appropriate because of the immature content. It is suggested that Mike write his own materials with the assistance of the teacher. In this way, the teacher can capitalize on his interests. The procedure recommended by Fernald (1945) seems appropriate. Furthermore, since Mike has acquired skills in using a typewriter he should type his own stories sounding out the words as he types.

procedure recommended by Fernald (1945) seems appropriate. Furthermore, since Mike has acquired skills in using a typewriter he should type his own stories sounding out the words as he types.

The special teacher should help him incorporate his spelling words in these written stories whenever possible because he is an extremely poor speller. The kinesthetic - tactile - auditory method should also be used in teaching spelling.

According to achievement test results, his grade placement was higher when the large print tests were used, therefore, it is recommended that large print materials be provided for this boy if for no other reason than his own greater comfort when using large print material.

Mike has had a preponderance of failure and thus needs considerably more reassurance that he has the ability and can make progress. Small increments of progress should be forcibly brought to his attention. Grouping and charting progress would seem to reinforce feelings of adequacy and encouraging him to put forth greater effort.

Arithmetic

Mike has not mastered arithmetic fundamentals. He needs meaningful drill to acquire arithmetic facts and concepts. It is suggested that the special teacher work with Mike using as many concrete objects as possible. Workbook and textbook assignments requiring considerable independent work does not seem to be indicated at this time.

Content Areas

Mike does not read well enough to be able to get information through reading text books and references at his grade level in content areas such as science, social studies, and health. It is suggested that this material be recorded on tape so that he can listen to the material in preparation for participation in discussions in the regular class. Prior to listening to such materials, the teacher and Mike should set up questions to be answered by listening to the tape recording. The teacher should also discuss with him his learnings after listening to the material. The role of the special teacher is to build a readiness for profiting from listening to the materials and help him evaluate his learnings.

Mike's low information score on the WISC, together with the teacher observations, suggests that perhaps he has not fully profited from experience. Since he is a poor reader, he has been able to obtain limited information through his own reading. The special teacher should plan as many direct experiences for this child as possible. If it can be arranged, the special teacher should accompany the regular class on field trips so that she can help Mike profit more fully from these experiences.

The special teacher will need to rewrite or administer orally any tests in the content areas that are given in the regular class. If the written assignments in the regular class are such that they require an excessive amount of time for Mike to complete, it is suggested that he record material on the tape recorder and submit this to the regular teacher in lieu of written assignments.

Counseling with Parents

Since individual counseling with these parents, the mother in particular, does not seem to have been effective, it is suggested that the parents be worked with in a group made up of parents of partially seeing children. This will, hopefully, be less threatening to the parents and may enable them to gain some insights into the understanding of the problems of children with vision defects and thus learn ways and means of handling this child more adequately.

In time, the social worker may wish to work with the parents individually to help them recognize their need to attend a clinic for intensive individual help.

Counseling of the Child

Mike has limited social skills which suggest the value of receiving help from a social worker in a group situation. The social worker will choose the group members very carefully. In this situation Mike will have not only opportunities to gain insight into his social behavior but will also have opportunities to develop more adequate social skills. Hopefully there will be carry over into other activities in the school and after school hours.

The social worker should also work with Mike on an individual basis to give him opportunities to work through some of his feelings which he may not wish to handle in a group situation.

Since Mike does not have a close relationship with his father, it may be advantageous for the social worker to explore the possibility of obtaining a "big brother" in the community for him. He seems to need to develop an identification with a male figure; currently he has overidentified with his mother.

Other Suggestions

A staffing should be held at the beginning of the school year with all persons who have or are going to work with Mike to review the educational treatment program. The importance of building up this boys self-concept and feelings of adequacy should be stressed. The regular and special teacher should not only help Mike experience success but should also provide Mike with opportunities to obtain recognition from his peers. Helping type the class paper or giving reports on his model cars are examples of such activities that may accomplish this goal.

The special and regular teacher should develop a close working relationship to insure communication and coordination of efforts. It is suggested that a regular schedule for this conference be set up early in the year to be supplemented by other conferences when necessary. It would seem that an hourly conference once a week would be minimal.

Case of Paul

I. Diagnostic Information

Reason for Referral

At the beginning of his second year in school, Paul was referred for individual study. He had recently moved to this locality and in accordance with school reports was placed in the second grade. However, he was moved to the first grade when it was discovered that he was not able to function academically on a second grade level. The school principal wished to have Paul's eligibility for the partially sighted program determined and referred him for a complete evaluation.

Background Information

Social History

Paul is born to parents of average socio-economic status. His father is a machinist and the mother frequently works outside of the home as a waitress. In addition to Paul, there are four older children in the family. When both parents are absent from the home, the paternal grandmother cares for the children. The parents have not always been cooperative with the school. The father reportedly has had outburses when conferring with school personnel. Both parents are generally hostile toward the school and blame teachers for the boy's lack of academic progress.

At home Paul seems to have very little supervision from his parents much of the time. He seems to enjoy playing outside but spends much of his time playing alone or with children who are considerably younger than he. As yet, he seems to have no well developed patterns of interest. Paul appears to have very little shared activities with his parents, although he is subjected to intense demands from them at times. Seemingly, he is not expected to interfere with his parents' plans or life at home. Paul is being seen by the school social worker for counseling. The social worker is trying to help Paul make a more satisfactory social, emotional and academic adjustment and is also working with the parents concerning the problems of the child.

Medical History

Information regarding the mother's health during pregnancy, circumstances surrounding Paul's birth, and Paul's developmental history all indicate normal birth and development. Paul's visual difficulties have been diagnosed by an eye specialist as severe myopia and amblyopia. Without correction he has a visual acuity of 20/200 in each eye. With correction, Paul's visual acuity is 20/70 in each eye. Paul's physical size is average for his chronological age. Paul passed the school hearing screening test. He has had some difficulty with a kidney ailment. Paul has a food problem in that he does not eat a well balanced diet and dislikes many nutritional foods such as vegetables. The social worker has tried to help the mother plan more nutritional meals for Paul. When he is confronted with work, Paul frequently resorts to physical complaints such as headaches. He tires very easily. The social worker has encouraged the mother to see that Paul receives more adequate rest at home.

School History

Paul attended kindergarten and entered the first grade at the average age of six. His experiences in the first grade were very unsatisfactory. The teacher was not aware of the fact that Paul had a visual impairment. He had not been seen by an eye specialist at this time and, therefore, was not wearing corrective lenses. According to reports from the mother and from the child, Paul was frequently punished severely by his teacher for not knowing the words during his reading lessons. Paul moved to this community at the start of the second grade but was placed back in the first grade when he was unable to do the academic assignments in the second grade. Prior to admittance to the partially seeing program, he was examined by an eye specialist and fitted with corrective lenses.

Paul has difficulty staying with a task to completion. He had developed some very poor work habits prior to the time his vision was corrected and the special teacher spent much time trying to help Paul develop better habits of work. Paul responded well to individual help, but he has had considerable difficulty working in a group situation. His unsuccessful experiences in the first grade have contributed to Paul's negative attitude toward learning and this attitude has been difficult to change.

Upon entering the special program, Paul had very little knowledge of word attack skills, especially phonics. Thus, he experienced much difficulty in attacking new words. He had a marked impairment in blending sounds. In addition, it was difficult for him to form visual auditory associations. He could not associate the sounds of letters and combinations of letters with their printed representations. His sight vocabulary was very meager. In the special program for partially seeing children, individual help for Paul centered around his reading problems.

Because his academic achievements were so markedly retarded, Paul was also retained in the second grade. The special teacher reported that in the area of reading Paul had made progress in acquiring the skills of phonics but is still deficient in this area.

Paul is now able to follow directions much better than when he first entered the program. He still tires easily but does not complain as much and does not complain of as many headaches or make as many trips to the rest room as was previously the pattern when he encountered difficult tasks in school. He continues to be an underachiever; the teacher notes that it takes him so long to get started with his work that he seldom finishes it on time. This study was conducted during Paul's second year in the second grade.

Psychological Findings

The school psychologist who examined Paul reported the following:

Paul appeared to be of average physical size for his chronological age. He was anxiously uncertain of himself and was extremely reluctant to involve himself in the demands presented him in the course of this evaluation. For example, when asked to draw a picture of a person

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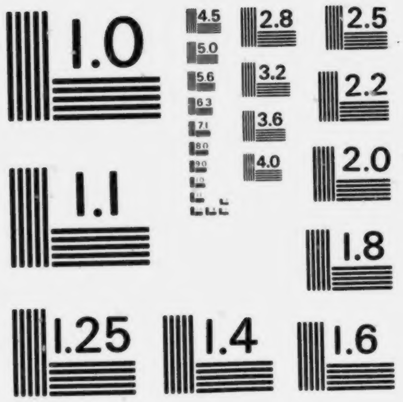
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

he seemed very perturbed. It was not possible to reassure him sufficiently in order for him to adequately cope with this rather simple task. He eventually drew a picture of his "baby" brother. It was observed that Paul kept his eyes very close to the paper when he was drawing or reading. His eyes were only 5 or 6 inches from his work. At times he put his head on the desk as though he wished to be away from the whole situation.

Paul obtained a mental age of 8 years, 6 months on the Binet Intelligence Scale. This is commensurate with his present chronological age of 8 years, 5 months and indicates that Paul is of average intellectual ability (IQ 99). On the basis of his measured mental age of 8 years, 6 months, Paul might be expected to achieve academically at about the level of grade 3.0. However, on the Gray's Oral Reading Paragraphs Test, he was not able to read at the lower level of this test, which is a grade placement of 1.0. Paul is severely academically retarded in all of the tool subjects of reading, arithmetic, and writing. Paul's inability to achieve academically at a level commensurate with his mental age is the result of his severe visual impairment as well as equally significant social and emotional adjustment difficulties.

Paul has received very little support, encouragement, or understanding within the home. Obviously he has not found the usual degree of acceptance from his parents. His inability to develop appropriate feelings of personal worth and value have resulted in his doubts about himself extending to all situations. Paul seems to see all situations as holding demands which are beyond his level of ability and which will only cause him to have more failures, thus reinforcing his self-doubts. Not finding the usual degree of acceptance within his home, he has reacted to his parents disregard for him by deep seated feelings of hostility and resentment. Paul is unable to express these feelings openly but must carefully repress them or seek indirect releases. Thus, Paul's sleep is disturbed by dreams of violence and by enuresis. He has constant fears such as thinking other boys want to fight him or are going to challenge him to wrestling contests. Paul's doubts as to whether other people like him or want him were not helped by his unfortunate initial school experiences where he was subjected to added physical punishment and rejection when he was unable to see the printed material presented to him in his reading lesson. He has a need for opportunities to verbalize his feelings in regard to his parents as well as for realistic experiences which would enable him to develop a more realistic and positive concept of himself and to gain status and recognition from other persons. Presently his self-concept is poor and he expects very little of himself.

In order for Paul to make a satisfactory school adjustment, he should have special help. He has difficient usable vision such that he would seem to profit from instruction in the partially sighted program. On the basis of the ocular examination and the psychological evaluation, Paul is eligible for such a program.

Information From Tests Given For This Study

On the verbal scale of the WISC, Paul obtained an IQ of 97. This compares favorably with his Binet IQ of 99 and indicates average intellectual ability. Paul's performance on the WISC subtests were above average on the similarities, comprehension and vocabulary scales, while he performed markedly below average on the information and arithmetic sections of the test. On the reading section of the Stanford Test, Paul received a grade placement of 1.8 on the small print test and 2.0 on the large print test. On the Stanford arithmetic test, he obtained a grade placement of 2.7 on both the large and small print tests. Paul obtained a grade placement of 2.8 on the Gray's Oral Reading Paragraphs Test. On the subtests of the Monroe Reading Examination, Paul obtained a grade placement of 3.2 on the Iota Test, and 3.3 on the Word Discrimination Test. He performed within the normal range on the b, d, p, q, o, u, n Test and his sound blending ability was above average. According to the Horn formulas, Paul should be achieving at a grade level of 4.3 in both reading and arithmetic. His actual achievement on arithmetic and reading tests indicate that he is not achieving at a level commensurate with his intellectual ability.

Paul's visual memory as measured by the Benton Test was slightly above average. Since Paul was older than children on whom the ITPA was standardized, this instrument was not administered to him.

In the area of social acceptance, Paul's total score on the sociometric scale was 15. This was markedly below the average score for his normal classmates which was 48. Paul's score for each of the nine situations depicted on the sociometric scale was below the average score in all cases. Not one child named Paul as someone with whom they's like to play outdoors, or listen to records. No one mentioned that they would like to invite him to a party. On the remaining six questions of the scale, Paul was chosen by classmates but this incidence of occurrence was so infrequent that he did not obtain average acceptance on even one of the questions.

On the California Test of Personality, Paul's total adjustment score fell at the 10th percentile with his total personal adjustment score and his total social adjustment score falling at this percentile also. His score was below the 50th percentile on all scales with the exception of the self-reliance, social standards and anti-social tendencies scales. On the community relations scale, Paul's score only reached the 2nd percentile. His scores on the subtests of sense of personal worth, feeling of belonging and social skills were also all markedly low (scores at the 10th percentile). Paul's social quotient on the Vineland was 94.

Paul's performance on the Michigan Pictures Test showed strong tendencies for him to view authority figures, especially his parents, as punitive and unable to understand his difficulties. Other than these indications, his stories were mainly descriptive.

II. Recommended Educational Treatment Based on Complete Differential Diagnosis

Paul is in need of intensive special help in several areas. It is recommended that he spend approximately one-third of his time in the special resource room for the partially seeing. The following special help is indicated:

Reading

Paul has not acquired word attack skills, especially the skills of phonics. While he is able to read second grade materials using mainly sight approach it must be remembered that he is two years retarded in grade placement and has average intelligence. Therefore, he is reading much below expectancy. He should be reading at the fourth grade level. It is predicted that if he does not acquire word attack skills his retardation will become more marked as the vocabulary load increases and he is not able to use word attack skills to pronounce words. Although the teacher reports that he has made some progress in acquiring phonics, he needs intensive drill to help him make visual-auditory associations. While he can discriminate between sounds that he hears, he has marked difficulty in associating these sounds with the printed symbols. Although he has had instruction in phonics in groups in both the regular and special class, his disability is so great that he needs intensive individual clinical teaching to overcome these disabilities. It is recommended that the teacher use the Hegge, Kirk, and Kirk Drills (1945) which uses a graphovocal approach to teaching disabled readers with problems similar to those of Paul's. Although this method is unnecessary for most children, Paul's difficulties are of such a nature that this approach is indicated. Currently, if he does not know a word by sight, he is not able to use any crutches to unlock the word since he has very ineffective phonic skills.

When Paul has mastered these drills, reading charts should be used. The stories on such charts should be developed with Paul. The teacher, of course, should help Paul control the vocabulary of such stories. These stories can then be typed on the large type typewriters especially designed for partially seeing children and be made into a reading book. It is felt that this approach will promote greater interest in Paul's learning to read. Drill should be given on any words Paul has difficulty reading. He should be required to write each word and sound out the parts of the word as he writes it. A file of words he is having difficulty reading should be kept and reviewed until he raises such words to a sight level. Spelling words should be handled in much the same manner. This approach uses the auditory, visual, and kinesthetic senses to reinforce each other in the process of learning words.

The teacher will need to give Paul much encouragement and praise for his efforts and accomplishments. The preponderance of failures in the past make him hesitate to put forth his best efforts for fear of failure. He seems to use various ways to delay completing tasks and sets low expectations for himself. To help him acquire work-study skills, it seems advisable to set definite but reasonable work schedules for him and expect him to complete his work in a given time. At first the work schedule for a given task should be short and lengthened gradually as he becomes more efficient. Recordings of how quickly and how well he is completing work assignments should spur him on to completing tasks within reasonable time limits.

While Paul scored no higher on large print materials than on regular size print, he does hold regular printed materials very close to his eyes (5 or 6 inches). It appears that he is more comfortable reading large print. Therefore, it is advocated that instructional materials available in large print should be obtained and those materials that can not be purchased in large print should be enlarged for him.

Arithmetic

Paul is underachieving about 1.6 of a grade level in arithmetic, but is doing grade level work. However, the special teacher should assist him in learning those arithmetic processes in keeping with his mental ability.

Content Areas

In those areas of the curriculum such as social studies, science and health, Paul should be able to function adequately as long as he can progress in reading acquiring word attack skills. The special teacher should make sure he grasps the concepts presented in the regular class by reinforcing such learnings. Any visual aids accompanied by discussions should be provided him to broaden his understandings and insure his grasping the important concepts and information.

To help Paul gain acceptance and help him make contributions to the regular class, the special teacher and regular teacher need to plan together activities or projects that fit into unit work that he can share with the children in the regular class. For example, he might prepare a report in the special class, record it on tape, and share his recording with the regular class; he may want to give a report directly to the regular class. By using references not being used in the regular class, Paul can contribute new or additional information. To develop a feeling of belongingness and acceptance is very important for this child since he is not well accepted by his peers according to sociometric data.

Counseling with Parents

These parents should profit from social case work in a group made up of parents of children with visual problems. They need more help in understanding and accepting Paul's handicap. They tend to lay the blame on the school for Paul's educational retardation. They also need individual social case work centering around the many problems of this child. The major problems that should be handled are closer supervision of the child, the setting of limits and expectations in line with his chronological age and mental ability and holding him consistently to these expectations, providing him with well balanced and nutritional meals, and planning family activities which will include him and the other siblings.

Teacher Contacts

The parents are so anxious about Paul's school progress that it would seem desirable for the teacher to set monthly parent conferences to share with these parents even small increments of progress of the child. These parents need to be reassured that Paul is capable of making progress academically and that he is provided with opportunities for doing so in the school.

It is important that the social worker and teacher work closely together so that the roles of each in working with the parents is clear and there is not undue overlaping.

Counseling the Child

The social worker should schedule Paul for group work and individual social case work. In the group work, perhaps there should be no more than three children in the group session, since Paul has so much difficulty gaining acceptance from others. In the smaller group the social worker may be able to structure more opportunities for Paul to interact favorably with these peers. In these sessions, the social worker will concentrate on helping Paul gain acceptance.

Paul also needs to be seen individually by the social worker so that he can be helped to work through some of his hostile feelings and reduce his tensions.

Other Suggestions

Sociometric data should be discussed with the regular teacher to see if she can group Paul with the few children in the regular class who chose him and encourage the development of closer relationships with these children. The activity chosen should be one in which Paul can function adequate. One such activity might be dramatizing a story. The special teacher could give him some extra help in the resource room so that he would be better prepared to contribute to such a group.

As is true in the case of all resource teachers, a close relationship must be established with the regular teacher so that the instructional program for this child will meet his unique needs. Weekly regularly scheduled conferences of these two teachers is a must. Additional conferences should be held during the week if there is a need.

At the beginning of the next school year a staffing should be held to review the educational treatment plan and set up the schedule for time spent in the regular class, resource room, and social case work service. The persons working directly with Paul should set up regularly scheduled conferences on a weekly basis to facilitate communication and an integrated program for this boy.

Case of Beth

I. Diagnostic Information

Reason for Referral

Beth was first brought to the attention of special services personnel when she was five years of age with a view toward determining her eligibility for placement in the preschool program for the blind.

Background Information

Social History

Beth comes from a family of low average socio-economic status. Her father is employed as a gas station attendant while the mother confines her duties to the home. Beth has a sister two years older than herself. The father is reported to be a rather insecure person who wishes to impress others to the contrary. The mother is described as much more gregarious than her husband. The parents, especially the mother, have difficulty comprehending the extent and implications of Beth's visual impairment. These parents report that there is considerable rivalry between Beth and her older sister.

She has had a minimum amount of contact with other children of her own chronological age. She engages in much solitary play amusing herself with her doll house and other toys. It is reported that at home Beth watches TV at times and is able to turn it off and on. Frequently, Beth bumps into large objects such as a chair or a sandbox. In spite of this, she is able to move around the house quite well. She helps her mother with such tasks as drying dishes, setting the table and making beds.

Medical History

The mother reported that she had been exposed to the measles when she was three and a half months pregnant with Beth. The doctor gave her a shot hoping that this would prevent the illness. Since she did not break out or feel ill, she presumed all was well. Pregnancy preceded normally and the delivery was also normal. Beth's birth was without complications. When Beth was about 6 weeks old, however, the mother began to wonder if something was wrong with her eyes. The mother reports that when Beth was three months of age, an ophthalmologist told her that the child had cataracts and "jumping pupils". Beth was operated on at 6 months, 1 year, 1½ years and 2 years for cataracts. At four she underwent surgery for a right eye muscle imbalance. Because of the frequent operations and doctor examinations, the parents state that Beth was very fearful of men for a long time and that to this day if a man with "big hands" touches her she will shy away from him. Because of the surgery, the many examinations and the probable pain associated with her visual difficulties, Beth was a fretful baby, crying and wanting to be held. The mother reports that she rocked Beth to sleep every day until she was 2 years old.

Reportedly the child was precocious in the accomplishment of various developmental tasks such as sitting alone, walking and talking. It is also reported by the mother that Beth was toilet trained at the age of one and fed herself since she was two.

Other than difficulty with her eyes, the parents describe Beth as a very healthy child. She has, however, had some difficulty with allergies, but she never had any of the usual childhood diseases. The mother reported that Beth did have some nervous mannerisms such as rolling on the floor, squirming and chewing on her clothing.

The latest ophthalmological report describes Beth's visual difficulties as nystagmus, strabismus, congenital cataracts which have been operated on, and aphakia in both eyes. Without correction Beth's vision is less than 20/200 in each eye. She wears corrective lenses but even with refraction her vision in each eye is less than 20/200. The doctor states that her vision will not improve and recommends that special education be provided for her. She passed the hearing screening tests administered in the school.

School History

At the age of five, Beth entered the preschool program for blind children. She was delighted to be attending school and was eager to learn. The teacher noted that she was a bright child, but she noted that Beth tended to be careless and wanted to finish things in a hurry. She displayed many nervous mannerisms and wanted to put everything (crayons, clothes, paper) into her mouth to chew. The teacher noted that Beth greatly enjoyed the opportunity to mingle with other children. She was outgoing and responded very well in group situations. Beth was noted to be progressing satisfactory with reading readiness in the preschool program. Her number work was above average but her writing was poor. The teacher noted that she was in too much of a hurry to finish and did not accept correction easily.

The next year at the age of six, Beth entered the first grade and was transferred into the program for partially sighted children. She used her vision well and it was believed that the program for the partially sighted would be more in keeping with her needs than the program for the blind. The special teacher observed that Beth was very flighty and she constantly bid for attention when she first entered the program. As time progressed she calmed down considerable. Coloring and writing are difficult for Beth, seemingly, because of her defective vision, poor motor coordination and hypertension. The teacher remarks that Beth is overly anxious and sometimes finds release in being a disturbance in the classroom. However, Beth was promoted to the second grade.

In the program for the partially seeing, Beth's special help centered around helping her in the area of reading. The special teacher reports that Beth has made considerable improvement in learning to accept limits. At the time of this study Beth was in the second grade.

Psychological Findings

Since her entrance into school three years ago, Beth has received two complete psychological evaluations. The following is the report of the psychologist who gave Beth her most recent evaluation:

Beth is a rather attractive girl whose physical size is somewhat smaller than that of children of her same chronological age. She appears to have rather poor motor coordination although it is not possible to determine whether this is actually because of poor control over her muscles or whether it is because she becomes overly anxious and hurries too much, thus misjudging her muscle movements. Beth seems to have visual efficiency primarily in the periphery of her visual field and thus must conctantly turn or tilt her head in order to take advantage of this vision. As she strives to see something that is presented to her, she seems to become more anxious. This anxiety increases if she is held to visual tasks for too long a period of time.

On the Binet, Beth obtained a mental age of 7 years, 10 months and her chronological age was 6 years and 5 months. This indicates that Beth is of superior intellectual ability (IQ 124). On the basis of her mental age, Beth might be expected to achieve academically at a second grade level. Her actual achievements, however, are at a very low first grade level. She seems to have particular difficulty in acquiring effective reading skills.

Beth has an extremely high level of anxiety. Although she is initially very cooperative and appears to be poised and self-confident, this is very quickly seen to be a matter of her putting up a good front in order to conceal strong feelings of personal inadequacy and uncertainty. By way of controlling her tremendous amount of anxiety, it is necessary that she have frequent releases, preferably of a motor nature. Thus she delights in becoming boisterous and engaging in rowdy physical activity. When she has reduced her level of anxiety in some release activity, she is better able to settle down and to work at tasks presented her. Beth seems to be aware of her great need to compete with her older sister. This may possibly be a reflection of her own feelings of personal inadequacy in not being able to cope with tasks with the same degree of effectiveness as other persons, possibly because of her visual impairment. In any event this seems to be posing severe social and emotional adjustment problems for Beth, and she obviously has need of reassurance as well as the opportunity to develop more realistic feelings of personal adequacy as a result of success experiences based upon her own efforts.

Beth is obviously a child with superior conceptual ability and this ability may prove to be even higher than indicated by the measured IQ in this evaluation, since Beth tended to be so anxious during the examination. In the classroom Beth has difficulty in accepting limits and concentrating for other than brief periods of time. Attempts should be made to help Beth feel less anxious and more secure in the classroom. Beth's doubts as to her acceptance by her parents should be discussed with Beth's parents in counseling sessions and an attempt should be made to help the parents gain a better understanding of the child so that they can help her feel more secure and accepted at home. In view of Beth's superior intellectual ability every effort should be made to keep from retaining her. She is eligible for continued placement in the program for partially seeing children. In such a program she can receive the individualized special help that she needs.

Information From Tests Given For This Study

Although Beth obtained an IQ of 124 on the Binet, her verbal IQ as measured by the WISC was only 103. On the WISC subtests, Beth scored above average on the vocabulary, similarities and information subtests whereas her performance on the comprehension subtest was below average.

On the Stanford reading test she obtained grade placements of 1.6 on the small print and 2.2 on the large print. As measured by the Stanford arithmetic test, Beth obtained a grade placement of 2.6 on the small print test and 2.2 on the large print test. On the Gray's Oral Reading Paragraphs, Beth obtained a grade placement of 1.6. On the subtests of the Monroe reading examination, her grade placements were 2.7 on the Iota Test, and 3.3 on the Word Discrimination Test. Her performance was normal on the b, d, p, q, u, n Test and her sound blending ability was above average. As computed by the Horn formulas, Beth's expected achievement in reading is a grade level placement of 3.3 and her expected achievement in arithmetic is a grade level placement of 3.0. Her measured achievements do not attain this level and indicate that she is underachieving.

On the Illinois Test of Psycholinguistic Abilities, Beth obtained a standard score of +1.15 on the total test. Her standard scores on the subtests were as follows: auditory-vocal automatic +1.27; visual decoding -1.72; motor encoding +.09; auditory-vocal association +.50; visual motor sequencing +.91; vocal encoding +.83; auditory-vocal sequencing +2.37; visual motor association -.56; and auditory decoding _.75. On the Benton Test of Visual Retention, Beth's performance was average for her age and mental ability.

On the sociometric device, Beth's score for the total scale was 33 as compared to the class mean of 54. On the questions concerning playing outdoors, talking with someone and inviting someone to a party, Beth received above average acceptance. No one chose her as a friend for a week-end trip, a companion for the movies or as someone they'd like to paint with in school. Although Beth's total acceptance score was below the class average, she had the second highest social acceptance score among the partially seeing subjects.

Beth's percentile scores were very high on all the subtests of the California Test of Personality with the exception of the nervous symptoms scale (40th percentile) and the community relations scale (10th percentile). Her scores were in the 90th percentiles on the scales of feeling of belonging, withdrawal tendencies and anti-social tendencies. On the Vineland, Beth obtained a social quotient of 94.

On the Michigan Picture Test, Beth's stories were mainly descriptive. However, they did reveal her great interest and enthusiasm for social activities with her peers. These stories also manifested Beth's tendency to attempt to control her parents and her confidence in believing that her parents will concede to many of her demands.

II. Recommended Education and Treatment Based on Complete Differential Diagnosis

Beth, who has above average intelligence, is a legally blind child who has sufficient usable vision to warrant placing her in the special program for the partially seeing, but she requires considerably more help from the special resource teacher than some children with 20/70 vision. She should be given special help in the resource room for a minimum of three hours daily. The areas in which special help is needed are as follows:

Reading

Beth is markedly retarded in reading. Emotional problems, her high level of anxiety and her distractibility all would seem to be factors contributing to this retardation. While Beth needs to master the skills of reading, perhaps she would achieve more in keeping with her potential if the amount of actual reading expected of her would be reduced since she becomes very tense if tasks requiring close eye work are expected of her for prolonged periods. She should receive instruction in reading from the special teacher two times daily. Each instruction period should be approximately twenty minutes. The periods can be varied according to the child's needs at a particular time. During these instruction periods Beth should be taught the word attack skills. Large type instructional materials should be used with this child at all times, preferably 25 point type.

Beth should be given a minimum of independent seat work calling for reading. It is felt that her visual problems are so severe that she has to put forth considerable energy to see. This may account, in part, for her tenseness and difficulty in staying with a task until completion.

Arithmetic

At this time, Beth is progressing better in arithmetic than in reading; however, her special need in this area is to provide her with enlarged copies of the materials used in the regular class. She seems to be able to function in the regular class in arithmetic. As the arithmetic becomes more complicated and when written problems are introduced, she may have difficulty since her reading is not up to grade level. If such is the case, the special teacher should give her help in arithmetic, too.

Content Areas

This bright child has the ability to conceptualize far beyond that of the average child. She is capable of contributing a great deal to class discussions if she has the necessary information. Reading in the context subjects should not be expected of her. She should be provided with taped recording of assignments. The special teacher or a volunteer can also read materials to her. She should dictate most of her written assignments to the special teacher. Next year typing instruction should be initiated with this child.

Counseling with the Parents

The parents, especially the mother, have difficulty accepting the fact that Beth is a visually handicapped child. It would seem advantageous for the parents to receive social case work in a group setting with other parents of visually handicapped children.

Individual case work with the mother might prove beneficial also. The mother needs to handle her feelings regarding her handicapped child. She needs to see the value of setting limits on Beth's behavior so that this child can make adequate progress emotionally and socially.

Other Suggestions

Since Beth is intellectually accelerated, it would seem highly desirable to include her in an interest group for the gifted such as foreign language which involves an oral approach. She should be able to learn a foreign language readily.

Creativity should be fostered in this child. She seems to be a child who expresses herself extremely well. She should be taught to use the tape recorder so that she can use this instrument to record her creative productions. This procedure would protect her from using her energies writing creative stories and poems. The Consultant for the Gifted should help the special and regular teacher plan ways of developing this child's creative ability and intellectual potentials.

Beth should be encouraged to continue her strong social interests by being provided with opportunities to participate in many group and club activities. These activities should provide her with releases for the many tensions she experiences and should also gain for her real enjoyment and satisfactions.

A staffing on this child should be held early in the fall to review the educational program designed on the basis of the differential diagnosis. The special and regular teacher need to have a close working relationship. A weekly hourly conference on a regularly scheduled basis is indicated.

Chapter VII

SUMMARY AND IMPLICATIONS

Problem

The primary purpose of this research was to investigate the specific strengths and weaknesses of partially seeing children by means of an intensive differential diagnosis. This study reports the results of Phase I of a larger study. Phase II of the study involves evaluation of the actual educational treatment of each subject based on his specific needs as delineated by the present research.

To determine the strengths and weaknesses of the subjects, it was deemed important to investigate the extent to which these handicapped pupils were achieving academically at a level commensurate with their intellectual potential. Likewise, it was felt to be pertinent to study how these partially seeing children function in various psycholinguistic processes and compare their visual and motor abilities with their auditory and vocal abilities. To determine a treatment program other aspects of their development such as visual memory, social maturity, social acceptance and general personality development was explored.

Organization of the Study

A total of 16 partially seeing children enrolled in grades 1 through 8, who met the Illinois criteria for admittance to the program, and who would be in school the following year to receive treatment in Phase II of the study, were included in this study, Phase I. This research is descriptive in nature in that an intensive investigation was made of the group to specifically identify areas of strengths and areas of weaknesses of partially seeing children. In addition, already existing case studies on each child were enlarged following the collection of relevant information about the pupil including both qualitative and quantitative data. This case study includes recommendation for an improved educational program specifically designed for an individual pupil based on the findings of the differential diagnosis.

Method of Appraisal

The intellectual ability of these subjects was assessed by the 1960 Stanford-Binet Intelligence Scale, Form L-M. The mental age of each pupil derived from administering this test was used in the Horn formulas (1947) to determine reading and arithmetic expectancies. The Stanford Achievement Test was used, using both large (16 point) and regular size type (10 point), to determine actual achievement in reading and arithmetic. Reading and arithmetic discrepancies were obtained by comparing the child's reading and his arithmetic expectancies with his actual reading and arithmetic achievement. By averaging the reading and arithmetic expectancies, average achievement expectancies were obtained. Average achievement expectancies were obtained by averaging the reading and arithmetic expectancy. These average expectancies were compared with actual average achievement in reading and arithmetic. Thus, average discrepencies in terms of grade placement were obtained indicating the extent to which partially seeing children as a group and individually were achieving at a level commensurate with potential.

Performance in oral reading was measured by the Gray's Oral Reading Paragraphs Test which had been enlarged to 18 point type and four subtests of the Monroe Diagnostic Reading Examination (Iota Word Test, the b, d, p, q, u, n, Test, the Word Discrimination Test and the Sounding Test). The specific learning abilities of the subjects were measured by the Illinois Test of Psycholinguistic Abilities, the verbal section of the Wechsler Intelligence Scale for Children, and the Benton Visual Retention Test.

Personal and social adjustment was measured by the Vineland Social Maturity Scale, a sociometric technique, the appropriate level forms of Personality, and the Michigan Picture Tests.

Information relative to the visual difficulties of the subjects were obtained from the detailed reports of the ocular findings. Data regarding the hearing of subjects were obtained from records of the child's performance on the school hearing tests and otological examinations, if the child failed the screening tests and was referred to a specialist.

Statistical analysis of the data included study of the data and the selection of appropriate statistical techniques. Care was taken to check the underlying assumptions of various statistical techniques and to use techniques which satisfied these assumptions. A .05 level of significance was used for accepting scores as significantly different and confirming hypotheses. The data were treated statistically for the group and also a case study approach was used. Thus, the relevant and pertinent characteristics of the subjects are described as they relate to the group and as they appear in individual cases. Three representative case studies are presented in detail.

Results

Hypothesis 1

It was hypothesized that partially seeing children enrolled in a special program (resource room) are not achieving at a level commensurate with their abilities. There was a statistically significant arithmetic discrepancy at the 1 per cent level between achievement expectancy in arithmetic derived by the Horn formula and actual arithmetic achievement as measured by the large print Stanford tests. Partially seeing children were underachieving -.86 of a grade level. When reading expectancies were compared with reading achievement as measured by the large print Stanford tests, an average reading discrepancy of -.46 of a grade level was obtained. This was not statistically significant. When the subjects' reading expectancies were compared with reading achievement as measured by the Gray's Oral

Reading Paragraphs, the average amount of underachievement was -1.41 of a grade level and was significant at the 5 per cent level of confidence. Average achievement discrepancies obtained from averaging the reading and arithmetic expectancies were compared to average achievement obtained from the Stanford tests in reading and arithmetic. The average discrepancy from expectancy was -.67 of a grade level. This attained statistical significance at the 5 per cent level. When both reading and arithmetic achievement were considered together, the partially seeing children are not achieving at a level commensurate with their abilities. When the results of all achievement tests are considered, the hypothesis that partially seeing children are not achieving on a level commensurate with their potentials received strong although not full support.

Hypothesis 2

It was predicted that the psycholinguistic processes involving visual and motor abilities of partially seeing children are significantly inferior to their auditory and vocal abilities. The data support this hypothesis. The subjects' performance on the various tests differed significantly at the 5 per cent level in the hypothesized direction. The significant differences are: auditory-vocal automatic from visual decoding and visual motor association; visual decoding from auditory vocal association, auditory vocal sequencing and auditory decoding; motor encoding from auditory decoding; visual motor sequencing from auditory decoding; and visual motor-association from auditory decoding.

Hypothesis 3

It was hypothesized that the visual memory of partially seeing children is inferior to that of normal seeing children. The analysis of the data did not support the hypothesis. There is a definite trend ($p = .10$), however, in the opposite direction inferring that the visual memory of the partially seeing tends to be somewhat superior to their normal peers.

Hypothesis 4

It was stated in this hypothesis that partially seeing children are less socially mature than their normal seeing children. This hypothesis received no support from the Vineland Social Maturity data. There was no significant differences between the social quotient of the partially seeing and normal seeing children.

Hypothesis 5

It was hypothesized that partially seeing children are less well accepted in regular classes than their normal seeing peers. The data confirmed the hypothesis. The number of partially seeing children who obtained below average scores on the sociometric device was significantly higher than the number of partially seeing children who obtained average or above scores. This incidence of occurrence reached significance beyond the 1 per cent level of confidence.

Hypothesis 6

It was predicted that the partially seeing children manifest poorer personality adjustment than children who have normal vision. The data from the California Test of Personality did not lend support to this hypothesis. On the majority of the subtests the number of partially seeing children whose scores placed them in the better adjusted group was higher than the number of subjects whose scores placed them in the poorer adjusted group. This incidence of occurrence reached statistical significance at the 1 per cent level for the social standards and social skills scales and reached the 5 per cent level on the feeling of personal worth, anti-social tendencies, family relations scales as well as for the total social adjustment scale.

Other information obtained from the analysis of data were as follows:

1. There was no significant difference in the mean IQ of the subjects measured by the Binet as contrasted to the verbal IQ obtained from the WISC.

2. Partially seeing children in the study were of average ability (Binet 104, WISC verbal 103).

3. There was a consistent and significant tendency for the subjects to do better on the similarities and vocabulary subtests of the WISC and poorest on the information and comprehension tests.

4. Reading achievement as measured by the large print Stanford Achievement Tests (16 point) showed a significant gain at the 5 per cent level over reading achievement as measured by the regular print Stanford tests (10 point). The mean gain in reading was .43 of a grade level. The mean gain in arithmetic when large print was used as compared to regular print was only .10 of a grade level and was not significant.

5. The subjects as a group did not have severe difficulties with the separate aspects of reading tapped by the Monroe Diagnostic Reading Examination, although some individual subjects manifested severe reading disabilities on this instrument.

Implications

The implications of this study, Phase I of a larger study, is particularly important in setting the framework for an improved educational program which will be carried out and evaluated in Phase II of the study which hopefully will be initiated in the fall of 1962.

Since there was no significant difference between the mean IQs of the subjects on the Binet and verbal scale of the WISC, it is implied that either instrument is equally as good in assessing intelligence and predicting school achievement of partially seeing children. However, there was a tendency for children in the upper ranges of intelligence to score lower on the WISC verbal scale than on the Binet. Therefore, it would seem advisable to administer both the WISC and Binet to obtain a more balanced picture of the child's learning ability.

Subjects in this study performed consistently and significantly poorest on the information and comprehension subtests of the WISC verbal scale. Exactly what is being measured by these subtests is open to question and any interpretation that is made of the findings must be tentative.

If the subjects performance on the WISC subtests on information and comprehension are really an indication of their differential abilities, then a program that emphasizes the acquisition, retention, and application of information would seem indicated. The ITPA findings give strong evidence that these children have adequate auditory and vocal skills but are markedly handicapped in linguistic processes involving visual-motor abilities. These findings suggest that an educational program should make use of their strengths in the auditory-vocal areas to strengthen their visual-motor areas which are weak. These experiences seemingly should bring into play all of the senses. For example, first hand experiences such as well planned field trips giving these pupils closely supervised experiences would foster improved acquisition, retention, and application of information. Intensive preplanning with the special teacher making ample use of visual aids accompanied by oral interpretation and discussions seems appropriate. It is suggested that this preplanning period include determining the information to be gained from the experience. The formulation of such questions should involve the auditory, visual, kinesthetic and tactile channels of learning. During the course of such an experience every effort should be made to see that learning is taking place. The teacher should be actively teaching and encouraging each partially sighted child to discuss aspects of the experiences throughout the trip. Tactile contact may be used to implement their learning. For example, if a trip is taken to the fire station, to go down the fire pole, to feel the fire hose, to ring the bell, to get up in the seat of the fire engine, to put on a fireman's hat all makes learning more meaningful especially if such experiences are accompanied by oral interpretations. Retaining information as to how to prevent fires is likely to require more than an oral explanation or reading such information in a book. Reading, writing, viewing films, conducting experiments, writing and reading reports are a few activities where it is possible to use the auditory, visual and motor means of communication. Thus, upon returning to the classroom learning should be reinforced keeping in mind that special help must be given to strengthening the visual-motor communication skills of these handicapped children.

Many of the above learning experiences are introduced in the area of social studies. However, in this particular area partially seeing children are frequently integrated into regular classes. The regular teacher cannot spend a disproportionate amount of time giving the partially seeing child the specific help not needed by the normally seeing children. To more fully profit from instruction in the regular class, the special teacher must prepare the partially seeing child in the resource room for learnings in the regular class and also help the partially seeing child reinforce learnings. This requires much time on the part of the special teacher and makes a strong case for the size of the enrollment in a special class to be reduced considerably. The special teacher with 14 children assigned to a resource room finds it difficult to give any one partially seeing child very much of her individual attention. With a maximum case load of 14, the teacher of the partially seeing usually concentrates on the skill subjects. The teaching of reading is apt to be given priority. If the special teacher is to really work with the specific weakness of each child, and if this is to be done intensively, then the present case load would not appear defensible.

Since the partially seeing children in this study performed significantly better on reading on the large-size type standardized test, it would seem advisable to provide these children with reading materials in large print. While the previous research on print size is inconclusive, for the best interests of partially sighted children, it seems advisable to provide them with large print materials if for no other reason than that they may read with more comfort and find reading less fatiguing. Fatigue can also cause irritability which may interfer with other learnings.

According to this research, the partially seeing children as a group were not achieving in reading at a level commensurate with their ability although the discrepancy between achievement and potential did not reach statistical significance on a silent reading test but did on an oral reading test. The important consideration is that some of the children were markedly underachieving and are in need of intensive clinical teaching in their areas of specific weaknesses in reading. These children who were markedly underachieving generally had eye anomolies of a refractive or fusion nature. These findings also have implications for reducing the size of the case load for a resource teacher of the partially seeing so that she can work intensively with such children on an individual basis.

The findings of this study suggest that more attention needs to be placed on the teaching of arithmetic by the teacher of the partially seeing. Since these pupils are achieving more nearly in keeping with their intellectual potential in reading than in arithmetic, it would appear that more time should be allotted in the special class for helping the partially seeing child achieve at a higher level in arithmetic commensurate with his ability. Here again, there is an implication for special teachers to have a reduced case load so that they can provide more individual help to these handicapped pupils in acquiring the skills of arithmetic.

As previously noted, the subjects seem to be average or above on measures involving auditory and vocal abilities but below average on tests of visual and motor abilities. Partially seeing children seem to have difficulty in obtaining meaning from visual linguistic stimuli. On the other hand, special teachers seem to be adequately developing the auditory and/or vocal abilities of these children. This information suggests that teachers of the partially seeing should incorporate in their instructional methods an approach which provides the partially seeing children with opportunities to respond through a combination of the visual, auditory, and motor channels. For example, rather than assign pages in the workbook for the child to complete silently and independently, the teacher should give the learner an opportunity to discuss the assignment, read the material both silently and orally, and respond in writing and orally. This approach would capitalize on the strengths of partially seeing in the auditory and vocal areas and use these strengths in building up the weaknesses in the visual motor areas.

Programmed learning using a teaching machine should be useful if one were available which would respond auditorily to the learners response. In arithmetic, for example, if in the machine 2 x 2 = appears and the learner writes 6, then the machine says 2 x 2 = 4. The 2x2 = appears again and the learner records the response 4 and the machine says 2 x 2 = 4 as it appears on the machine. This would be an example of using the auditory linguistic skill to strengthen visual linguistic skills.

It would also appear that the curriculum of the partially seeing child should include more shop work and craft activities than might be necessary for normal seeing children, because they are low in motor abilities. Seemingly, the skill subjects could be correlated with such activities to the advantage by these handicapped pupils.

Sociometric data indicate that the partially seeing children are not well accepted by their peers. The implication is for the school to devise ways and means of helping these children gain acceptance. More thorough interpretation of the strengths and weaknesses of these children to the normal seeing children and to regular teachers might prove fruitful in bringing about greater acceptance. If the class load of the special teacher is reduced so that she is able to give more individual attention to each partially seeing child on a clinical teaching basis, hopefully he will have more to contribute to regular classes and be a more acceptable member.

Still another possibility is that partially seeing children through group and individual social case work may be helped to gain a better understanding of themselves, become more accepting of their own handicap, become more emotionally secure, and be able to acquire social skills that are acceptable to their peers.

Data from the case studies indicate that some of these children have impaired parent-child relationships. This may infer that parents need help in understanding and handling these partially seeing children. It is suggested that a social worker work with parents in groups and individually in bringing about an improved understanding of the problems of these children and of their child rearing practices.

The implication that some of these children need a clinical type of teaching has implications for a teacher training program for the teachers of the partially seeing. It would appear that the curriculum of these special teachers should include a course or courses in clinical methods of teaching and should have opportunities in their student teaching to use clinical methods with partially seeing children under close supervision.

It appears that these children do not perceive themselves and their abilities realistically which implies they may not understand and accept themselves as they are. Thus, special provisions should be made to assist these children in developing more realisticand positive self-concepts. One possibility is that of providing social case work in groups and individually to help these children handle their feelings more adequately. Another way the school could approach this problem is to provide older partially seeing children with vocational counseling and progressive work experience while attending school to enable them to acquire the prevocational skills necessary for subsequent employment. This type of help should aid the handicapped child and his parents to set realistic vocational goals for him.

Needed Research

- A study should be conducted to determine the extent academic achievement can be promoted by reducing the size of the case load of a teacher of the partially seeing giving her more time to work individually with children using clinical methods of teaching where indicated by an intensive differential diagnosis.

- No researcher has explored the extent to which creativity can be fostered among partially seeing children. In an age where creativity is especially valued and needed, it would seem advisable to encourage the development of creativity among the handicapped as well as the physically normal.

- Various ways of fostering improved social and emotional adjustment among the handicapped should be investigated.

- More precise studies on print size should be conducted determining the impact of various size print on the physical and emotional adjustment of the individual over a prolonged period of time.

- Programmed learning for the partially seeing using teaching machines which make provisions for auditory-vocal and visual motor responses should be developed and evaluated by means of controlled research.

- The effects on the social and emotional adjustment and subsequent vocational adjustment of older partially seeing children who receive the services of a prevocational counselor and are provided with progressive work experiences while attending school is an area worthy of investigation.

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APPENDIX

WHO ARE PARTIALLY SEEING CHILDREN?

"Children having a visual acuity of 20/70 or less in the better eye after the best possible correction, who can use vision as the chief channel of learning; and children who, in the opinion of the eye specialist, can benefit from either temporary or permanent use of appropriate special facilities."

National Society for the Prevention of Blindness, Inc.

RECOMMENDED BASIS FOR PARTIALLY SEEING CHILDREN NEEDING SPECIALIZED HELP IN A SCHOOL PROGRAM

1. All cases must be considered individually.

2. Children having a visual acuity of 20/70 or less in the better eye after proper refraction.

3. Any child who, in the opinion of an eye specialist*, would benefit from specialized help subject to suggestions for amount of eye use, treatment, etc.

4. All partially seeing children assigned for specialized help must be mentally educable in the program of the regular school.

In addition to the above there are instances when, on recommendation of the physician, temporary assignment of partially seeing children for specialized help should be considered. For example:

1. Children suffering from non-communicable diseases which affect the eyes.

2. Children making readaptation of the eyes, or a psychological readjustment following eye operation, as in case of eneucleation.

3. Children who are recovering from effects of such diseases as measles, scarlet fever, etc., and who need special eye care until they are able to assume regular class work without eyestrain.

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*Here the term "eye specialist" is used to designate the ophthalmologist or the optometrist who secures ophthalmological consultation whenever feasible.

SOCIOMETRIC SCALE

1. With whom would you like to go to the movies?

1st choice ______________________________

2nd choice ______________________________

3rd choice ______________________________

2. On a nice summer day with whom would you like to play outdoors?

1st choice ______________________________

2nd choice ______________________________

3rd choice ______________________________

3. On a windy, rainy day with whom would you like to play indoor games such as cards, checkers, etc?

1st choice ______________________________

2nd choice ______________________________

3rd choice ______________________________

4. With whom would you like to listen to records?

1st choice ______________________________

2nd choice ______________________________

3rd choice ______________________________

5. If you were going to see a ball game, with whom would you like to go?

1st choice ____________________

2nd choice ____________________

3rd choice ____________________

6. If you were going on a week-end trip with your parents and could take a friend, whom would you like to take?

1st choice ____________________

2nd choice ____________________

3rd choice ____________________

7. If you could talk with someone and if you could talk about anything you wanted, whom would you choose?

1st choice ____________________

2nd choice ____________________

3rd choice ____________________

8. If you were having a party, whom would you like to invite?

1st choice ____________________

2nd choice ____________________

3rd choice ____________________

9. If you were painting Christmas decorations with whom would you like to work?

1st choice ____________________

2nd choice ____________________

3rd choice ____________________